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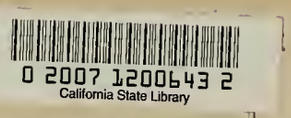

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JULY 5, 1884.

VOLUME XLIX Number 1.

The California Rock Drill.

We had an opportunity of examining at work this week the California Rock Drill, a new machine recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency. It has the peculiarity of being a perfect hand or power drill, and the blow on the drill bar is made by a sledge just the same as in hand drilling, which is a different system than is usually adopted.

The engravings given herewith illustrate the machine, showing it as driven by hand, by hurdy gurdy wheel, and by direct attachment to hurdy gurdy. There is still another form where an air or steam cylinder is attached directly to the crank.

A body bar carries the power mechanism, the drill, the hammer, and the means for operting the hammer and rotating the drill, the bar being suspended from and adapted to slide on a cross-bar attached to a supporting column.

The attachment is made in such a manner as to have a vertical horizontal or inclined adjustment. The cross bar has a trunnion journaled in a bearing fitting in a sleeve and fitted upon the column. As the crank or pulley rotates the shaft, a cam or eccentric draws the hammer back, at the same time compressing a spring, which on being released by the cam, throws the hammer suddenly against the rear end of the drill. The drill bar is so arranged by means of a tension apparatus and a spring that there is no jar and this tension is capable of regulation. The small coiled spring acts so as to take off the jar. The feeding apparatus is arranged by a hand screw, a chain wheel, and chain rotating the drill bar automatically at each stroke. With power the machine strikes about 400 blows a minute; by hand of course fewer blows are struck.

Fig. 1 represents the hand rock drill, with fly-wheel and crank, operated by hand power. This machine is fitted to use ¾ octagon steel, and has a capacity to drill 2 holes 3 feet in depth without moving machine from guide-bar, has a 7-lb. hammer, and can be run by hand 150 blows per minute, and strike any blow it is possible to make drill bits stand in hard rock. The power necessary to run this machine is very light, so that any man can work the machine until the drill bit becomes dull without being exhausted. The weight of this machine, including column, is about 175 pounds, and owing to the easy manner by which the cross-head can be removed from the machine, one man can easily handle and set up for work, so no part will weigh over 80 pounds. This machine costs, with one set of 8 drills, two extra springs and chuck, $225.

Fig. 2 shows the hand drill driven by power. This has a groove cut in fly-wheel, driven by an endless rope from a hurdy gurdy wheel placed at any distance desired away from the machine. The hurdy wheel being light, can be easily moved and handled by one man. They have a tightening device on the hurdy frame, which always keeps an even tension on the rope. The machine driven in this manner can be run 250 blows per minute with a 3-16 nozzle under 175 feet hydraulic pressure, or driven with a steam pump at 80 pounds pressure. Price of this machine, including hurdy wheel, hose, gate, nozzle, and everything complete for work, $300. The rope can be run any reasonable distance from the source of power.

Fig. 3 shows the power drill operated by a hurdy gurdy wheel attached direct to the machine. This machine can be driven by a hurdy wheel, as shown in the cut, or by an endless rope running to any distance from the machine, driven by steam, hydraulic or horse power. In places where water is an object, this machine can be operated by a steam pump, with water tank or sump, pumping the water over and over if desired. This machine is fitted to use ⅞ or 1 inch octagon steel, will drill 1¼ inch holes five feet or more in depth without removing cross-head from machine, and can be run up to 400 blows per minute. This machine is especially designed to drill in cement, gravel or scamy rock, where the drill is inclined to run to one side; the drill being held firmly by means of a rest near the mouth of the hole, also at its rear end in the same manner, it is almost impossible for the drill to advance other than in a straight line; in other words this machine will drill in a straight hole in material that other machines can not. The weight of this machine is about 375 pounds. Price, including hurdy wheel, $375; or without hurdy wheel, fitted to run with endless rope, $325.

A larger size power rock drill, with trunk engine combined, mounted upon column is also made. This drill can be run by live steam direct, or by compressed air, as desired. Duplicate parts may be obtained also.

By striking direct on the head of the drill and holding the drill against the bottom of the hole while it revolves positively at each stroke of the hammer, a great advantage is gained, causing each and every blow on the drill, to do the same amount of work without lessening the force of the blow by turning the drill.

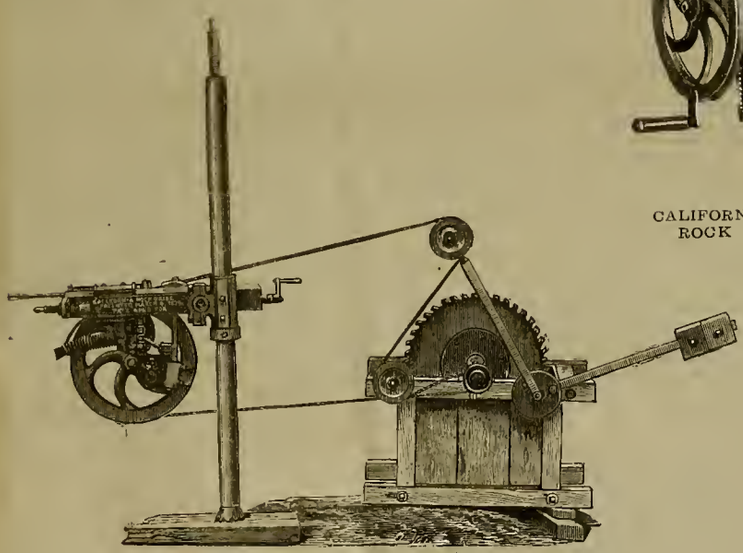
With the large power drill an eccentric operates the hammer, instead of a cam, so a very light blow may be struck on starting a hole, by running more slowly. When once the hole is started, 400 blows a minute may be given.

This machine is an exceedingly practical one, and requires little power to run it. The hammer used is really a sledge, and the spring throws it forward with good effect. In working in granite, the hand drill will drill an inch a minute in a dry hole.

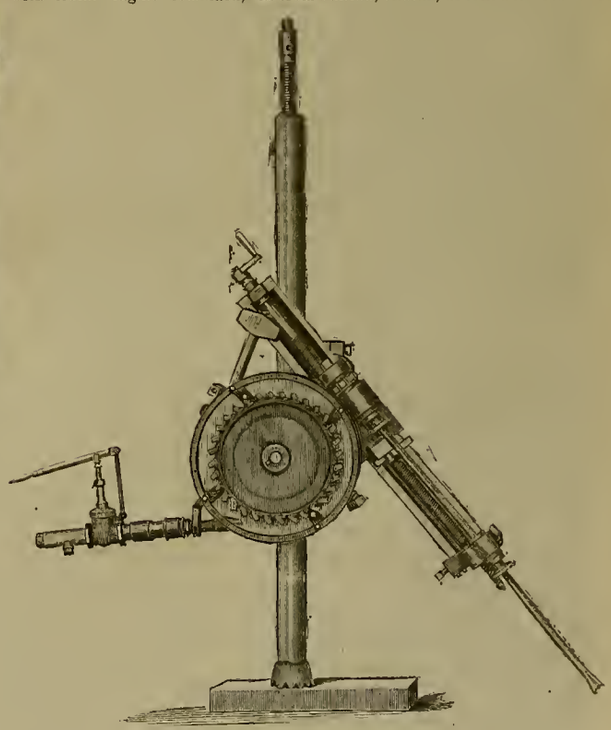
Three of these drills have been at work at the large South Yuba tunnel, five miles from Nevada City, for a year and a half. These have been run by a little hurdy gurdy direct on the machine. They had 175 feet of pressure and the machine uses about three inches of water to run it. Water was carried into the tunnel in a pipe. The power drill will do the work of ten men.

The company is now constructing 50 hand and power drills at Pittsburg, and making them out of crucible steel, so as to get lightness and strength. These will be here soon to be put on the market. Mining men will do well to call at the headquarters of the California Rock Drill Co., 32 First street, and see these various styles of drills at work.

CALIFORNIA HAND ROCK DRILL.



CALIFORNIA HAND ROCK DRILL, WITH HURDY GURDY.



CALIFORNIA POWER ROCK DRILL.

ALASKA MINES.—Mr. George E. Pilz writes us from Juneau, Alaska, as follows: Times are lively up here. The placer mines are all running full blast, and are taking out the usual amount of dust. Heavy preparations are being made to start the quartz mines in earnest. The Alaska Manfg. Co. have penetrated their ledge by a tunnel, by aid of power drills, and have proven their ledge to be over 500 feet in width, all in a good average ore, of about eight to eleven dollars per ton. They are building now a saw mill on their mill site to cut their timber and lumber for a 120 stamp mill. They are employing every idle man, white as well as Indian, in grading, ditching, etc. Nothing is doing yet on quartz on the mainland.

THE Central and Southern Pacific Railroad Companies paid off resident employes Tuesday, and those living in the interior will receive their wages within the next few days.

THE ten-stamp mill on the Marshal mine in Calaveras is being rapidly pushed forward to completion. Big results are anticipated when the mill gets to work.

CORRESPONDENCE.

We [illegible], unendorsed, opinions of correspondents.—EDS.

The Climate of Reno and of the Sierra Nevada Region in General.

[Written for the PRESS by PROF. GRANVILLE F. FOSTER.]

The climate of any particular place is a resultant of the direct effect of the sun's rays (which effect differs in the ratio of the cosine of the latitude) modified by altitude above the sea level, quality of soil, slope of land, relation to mountains in the vicinity, contiguity to bodies of water, amount of cloudiness, amount of rainfall and direction of prevailing winds. What the effect of each one of these may be in the make-up of the observed climate of any given place is the province of the meteorologist to determine, and though absolute truth may not always be reached, yet he is able to resolve the resultant into elements which at least will account for the facts observed. It is the aim of the writer of this article to present some of the peculiar features which characterize the climate of Reno; and since this city is so situated as to be admirably adapted to be used as a representative of the climate of the whole region of the Sierra Nevada mountains, the general features of this entire region will thus indirectly be presented.

Reno is situated in the Pacific coast region, in latitude 39½° north, at an elevation of 4,507 feet above tide-water, and is moreover shut off from the direct influence of the Pacific by the mighty mountain barrier which lies to the west. The whole Pacific coast (which by common consent is understood to mean the whole country for three or four hundred miles inland which borders on the Pacific ocean) differs very widely indeed in climatic conditions (and hence in climatic character) from those that prevail in the valley of the Mississippi and upon the Atlantic slope. In either one of the latter, the climate is characterized by extremes—extremes in temperature, rainfall, storms, and calms, with now and then a cyclone, by way of variety. The extremes in temperature are not apparent alone in the mere contrast between the mean of winter and that of summer, but oftentimes a single day may present extremes of heat and cold, of storm and calm, of sunshine and shade, perfectly astounding to a resident of the Pacific coast, who for the first time experiences them. An incident coming under the writer's observation will serve to illustrate the fact that this statement is not overdrawn. The locality was Alton, Ill., on the Mississippi river, latitude 39° north, the time midwinter. A season of extraordinary warm weather for the season, was succeeded by a violent thunder-storm, and this latter by a gale blowing from the northwest, with almost the speed of a hurricane, and three hours were sufficient to reduce the thermometer from 72° to 32° and the next morning the low temperature of 20° below zero was reached. So very rapid was the change that it was facetiously said that ducks had their bills frozen into the mud before they were able to extract them. A few years ago in the State of Minnesota there had been a season of unusually warm and pleasant weather during the month of January, and even February was ushered in with the same weather still continuing. On a certain day that seemed to reach the very climax of the beautiful, hundreds of farmers, many accompanied with their families were spending the day in Saint Paul and Minneapolis. No suspicion that any change could occur in the weather, seemed to enter the minds of the great number of people who were visiting these cities, since not a cloud obscured the sky and the sun shone out kindly and warmly. A little after noon the wind changed, a gale set in, the sky speedily clouded, instantly the very sky was filled with fine blinding snow and the thermometer rapidly descended, the farmers hastened towards home, but in many cases, horses and their riders were frozen still ere they were able to reach half the distance. These blizzards of Dakota, Iowa and Wisconsin are no myths: they are, alas, altogether too real and too natural to make them desirable to him who unfortunately is called upon to brave their fury, nor are they so infrequent as to be considered anomalous, for it is a rare thing indeed if a winter should pass away without one or more of them. On the other hand, we might expect the summer of these regions to be temperate and delightful, but that they are almost as disagreeable and as disastrous in their effects as the winters, let one judge from the long list of persons published in the newspapers as dying of sun-stroke in these very regions every summer.

In Boston, with an oceanic climate, the annual range of temperature is fully 140°, and in St. Paul, with a continental climate, it reaches 150°, but in Reno in 1882 it amounted to no more than 90°, and even in 1883, when there were extremes of cold in winter and of heat in summer, it only reached 105°. In San Francisco the range is seldom more than half this last named amount.

The climate of the whole Pacific region, though great differences are seen in comparing different sections, is characterized, as compared with other regions of the continent: 1st, by a less difference between the mean temperature of winter and that of summer; 2d, by a higher mean annual temperature than would be expected both from latitude and from elevation above the sea level; 3d, by a greater difference between the mean temperature of the day and the night; 4th, by an absence of cyclones and blizzards, and a paucity in the number of thunder storms; and 5th, so far as California and Nevada are concerned, by periodical rains, the summers being perfectly dry and the winters more or less wet, though very little rain ever falls in Nevada.

Waiving a reference at least here to the first feature as named above, the truth of the second will be seen from the fact that at Eastport, Maine, in latitude 44° 50', the mean annual temperature is only 43° Fahr., but one must go on the Pacific coast as far north as 57° in order to find the same mean. As we move from the shore of the Pacific inland, the extremes are found to be more marked, but nowhere are there any changes which approach in amount and violence those which obtain east of the Rocky mountains, while even here the moderate changes which do obtain are far less disagreeable than such changes would be elsewhere, since a cold but very dry air (even when the temperature is far below zero), is far more bearable than a damp air of a high temperature, as witness the piercing effect of an "easter" in Boston, or a "norther" in Texas, for, although the temperature when either of these winds are blowing may not be below 45°, yet it will be most uncomfortable, disagreeable, piereing, as it is familiarly said, "to the very bone." Again, when great heat prevails, the great dryness of the air in California and Nevada prevents it from becoming oppressive, since the very rapid and yet often insensible perspiration from the skin keeps the heat of the body within a comfortable limit. The third feature mentioned is indeed a marked one for the whole Pacific region, but of course more especially true of the higher levels of the Sierra Nevada mountains, more particularly on the eastern slope. Here, in consequence of the almost constant sunshine, the days are warm even in mid-winter, as high as 6,000 feet above the sea, while by the rapid radiation of the accumulated heat of the day through a dry and thin atmosphere the nights, even in midsummer are quite often very cool. In summer the days in regions even as high up as 8,000 to 10,000 feet are often very warm, and on the high peaks of the Sierra Nevada mountains at, an altitude of 12,000 or 13,000 feet, the heat at mid-day is great enough to make out-door traveling pleasant without an overcoat. The writer has found it quite pleasant in an afternoon of mid-winter, in direct sunshine, to go without an overcoat, though several feet of snow lay unmelted around him, even at as high an altitude as 7,000 feet above sea level. It is these warm sunshiny days and cool, clear nights, when the very stars seem to hang like gems upon the brow of the sky, that constitute the peculiar charm of the climate of the Sierras—a climate to be appreciated by those who have suffered from the damp, sultry atmosphere of a mid-summer in the valley of the Mississippi, where oftentimes the nights are scarcely cooler than the days, and here, for the benefit of the general reader, the writer will consider briefly a few of the reasons for so pleasant and agreeable a climate as exists in Reno, and in the Sierras generally.

It is generally known that on ascending upward from the sea level the temperature of the air steadily declines, the fall being about one degree Fahr. for every 330 feet of vertical elevation, but it is not generally known that the effect of the sun's rays, when arrested, as upon the skin for instance, is found to increase as the altitude above tide-water becomes greater, and not to decrease as many suppose. A traveler, who some years since ascended the very lofty volcanic peak of Iztaccihuatl, near the city of Mexico, makes the statement that when far above the line of eternal frost, the direct rays of the unclouded sun peeled the skin off his neck, face and hands, while waist deep in snow. Now, the low temperature of the air in high altitudes is easily accounted for.

The sun's rays, in consequence of their intense penetrating power, readily pass through the atmosphere. A small percentage [according to observations with Pouillet's pyrheliometer, from 20 per cent to 40 per cent (varying with amount of vapor), when the rays penetrate vertically,] being struck down or absorbed in the fifty miles of medium through which they must pass. The amount of heat thus absorbed in the passage of the sun's rays, does not invalidate the general statement that the air is heated by convection, that is to say, the air in contact with the earth alone is heated, and thus becoming specifically lighter, is pushed upward by the colder air rushing in to take its place. Now let it be supposed that in any given region equal weights of air taken from different elevations contain equal amounts of heat, yet the tenuity or thinness of the air in the upper strata of the atmosphere would, in such a case, indicate that the intensity of the heat in such expanded air must necessarily be very low. Though not generally appreciated, there is a great difference between intensity and amount, as applied to the forces of nature.

All bodies in expanding consume more or less heat, or make it latent, as well as diminishing the intensity of the heat not made latent; hence, in the process of expanding air the sensible heat is diminished both in quantity and in intensity. The heat consumed or rendered latent, called scientifically *specific heat*, is used in effecting certain molecular changes absolutely necessary to the phenomenon of expansion. In consequence of these scientific facts the air grows colder as the altitude above the ocean increases.

But, as before said, there is a measurable quantity or amount of heat stricken down or absorbed in the passage of the sun's rays through the atmosphere. This amount will vary, first as to the depth and density, and second as to the humidity of the atmosphere passed through; and since these conditions increase in amount (density and humidity increasing in an increasing ratio) as the level of the sea is approached, the amount absorbed in the first thousand feet above sea level being considerably in excess of the amount absorbed in the second thousand, and so on. We would therefore reasonably expect that when the sun's rays are caught and imprisoned they would show a higher effect in higher altitudes than in lower ones, and such, on experiment, is proved to be the fact. Using Pouillet's pyrheliometer in very high altitudes, it has been proved that the sun's direct effect is sufficient to elevate the mercury of a thermometer to many degrees above 100° Fahr., while at the same time the temperature of the surrounding air was 40 or 50 degrees below zero. By means of such an instrument it has been conclusively proved that the intensity of the sun's rays grows greater from the level of the sea upwards, the difference in intensity at any two points at different altitudes in the same locality being measured exactly by the amount of heat absorbed in the vertical depth of air lying between the two points. Though not essential to the design of this article, the writer cannot help referring to the question which will likely arise here in the reader's mind, viz.: If it is true that the direct rays of the unclouded sun have greater effect when arrested in higher than in lower altitudes, why is it, then, that the snow on the summits of the loftiest mountains never melts, though bathed in the direct rays of even a tropic sun? The answer is easy. Snow does not, like rocks, earth, wood, etc., arrest—it only reflects—and whenever the temperature is far below the freezing point, all the heat falling upon the snow is reflected into the cold air, to be dissipated through it, or if there be any arrest of heat at all (and there is a very little), it is not sufficient to raise the temperature of the snow to the melting point. The reader will readily perceive that when the temperature of the air is above the freezing point the melting of the snow mainly proceeds from the heat imparted to it from the warm air in direct contact, though in this case the sun's direct rays do have more influence than when the temperature is very low.

The facts which have just been stated fully account for the very mild day-temperature of the elevated regions east of the Sierra Nevada Mountains, in which the writer of this article lives. Because of the extreme dryness of the atmosphere and its thinness as well, the sun has no sooner risen, then there is a sensible rise in the temperature, increasing till after noon, making even a midwinter afternoon pleasant, especially in the direct sunshine, while, on the other hand, the quick radiation of the earth's heat, through the very same dry and thin atmosphere makes even the summer night (however hot the day) cool and pleasant, hence this region, partaking of the general mildness of the Pacific Coast, modified, however, duly for the altitude, cut off from Arctic waves of air and hence from all blizzards, is characterized by a high day-temperature and a low night-temperature throughout the year, while as compared with the same latitudes in the East, the contrast between winter and summer is not very great.

And now we will hastily bring this article to a conclusion by presenting a few statistical comparisons between Reno, Boston and Chicago, all three of which have very nearly the same mean annual temperature.

	Spring.	Summer.	Autumn.	Winter.	Mean.
Reno.....	47.86°	74.19°	49.47°	23.44°	48.74°
Boston.....	46.30°	69.10°	51.60°	28.90°	48.90°
Chicago.....	44.90°	67.30°	48.80°	25.90°	46.70

Let no one imagine that because of the similarity of the above figures, that there must needs be a resemblance in respective climates of the three cities, since there is very little resemblance at least between Reno on the one hand and Boston and Chicago on the other in this respect. The high summer mean of Reno signifies very warm days (not disagreeable days however because of the dryness of the air) though the nights are cool, while the heated season of Chicago and Boston, however brief it may be is especially disagreeable, from the fact that the nights are nearly as warm as the day, and the damper air adds materially to the discomfort. The low winter mean of Reno does not signify a more uncomfortable and disagreeable winter than at Boston or Chicago, since from the clear, warm days (however cold the nights may be,) the absence of strong winds at this season, the winter days at Reno are almost as pleasant as the summer ones.

Reno, Washoe Co., Nevada, June 19, 1884.

Lost Rivers Vs. Wood River.

A Coming Mining Region.

EDITORS PRESS: It is now well established that the Wood River region contains some, I might say, "many paying mines." But I wish to call the attention of mining men, capitalists and prospectors, to that region known as Big and Little Lost rivers. Here is a country that is bound to prove very rich and extensive in lead, copper and silver mines. Many large veins have been discovered and the surface showings of ore rivall any mines on Wood River for both richness and quantity of ore. On Little Lost river, I have taken surface ore from the Ingersoll mine, that assays over a thousand ounces in silver besides being heavy in lead and copper. The vein is large and well defined running through heavy iron stained quarztite. The lode is nearly vertical. I know of no better prospect for a heavy paying mine than this same Ingersoll claim. Then we have in this district, one, if not the largest galena carbonate mines in Idaho territory, and that is the Daisy Black Mine. It is wonderful to behold the great body of ore now in sight at this mine. It is estimated that there are over forty thousand tons of galena and carbonate now exposed, still the deepest shaft is only a little more than a hundred feet. The pay ore is from 12 to over 75 feet in width. The outcrop is boldly traceable for a thousand feet. This mine like the Ingersoll, is in a black iron quartzite formation. The ore goes down nearly vertical and is evidently a fissure vein. Considerable of the Daisy Black carbonates carry over a thousand ounces of silver per ton, and as there are both lead and copper ores associated in this mine, there is every reason to believe that the ore will continue rich in silver.

In Idaho wherever lead and copper ores abound in the same mine there is the place to get high-grade silver ores. Between the Ingersoll and Daisy Black is situated the Tyndall lode, another splendid showing of carbonate, galena and copper ores. North of, and adjoining the Daisy Black, we find the Alice and Great Northern claims, both of which are fine prospects for proving good paying mines. The ore is of good grade to commence with. I know of no better camp for mining capitalists to purchase good properties than what I know of on Little Lost river. These mines can be cheaply developed; wood and water is plentiful, lime and iron in abundance for fluxes. The climate is such that the mines can be worked all the year.

I am really surprised to see this region opening up so slowly. Surely no capitalists have examined this region! If they would I know they could soon find splendid bargains and open up these great veins of rich ore. Then, over on Big Lost river, near Alder gulch, are some of the largest lodes of heavy copper ores known in the Northwest, mountains of ore, not only heavy in copper, but carrying also considerable silver. And in this same locality are several large galena carbonate lodes that are opening up very satisfactorily to the fortunate owners. This Big and Little Lost River region is, according to geological evidence, a great mineral country. It is composed mostly of crystalline and metamorphic rocks, with here and there a dyke of lava sufficient for mineralizing or concentrating the ores into large bodies, so as to be economically and very profitably worked. The ore is rich, and there is lots of it; consequently these Lost River mines—lead, copper and silver—are going to prove of immense value. Should any mining capitalists read this article, I trust they will investigate this Lost River region, and open up some of these large lodes. They can be bought at a great bargain and on easy terms. About all that is needed is mining machinery, concentrators and smelters for treating the ores right at the mines. There is no question about the mines paying. The mines show for themselves. The only question is, will monied men go in and examine? The prospector can't do it all. He can find the mines, but it takes money to buy quartz mills and smelters. In concluding this article it may be well to say, that I am willing to verify my statements by going with any mining capitalists, and show to them the mines that I have seen, and also show to them the bargains that I know of in the Lost River country.

It is not necessary to go to the cold snowy Coeur d'Alene region for goodly vestments, when fully as good may be had in a far more genial climate.

CHARLES F. BLACKBURN.

Salt Lake City, Utah, June 24, 1884.

YAVAPAI COPPER BONANZA.—Since the 15th of last month, on which day the smelter of the United Verde Copper Company resumed operations, it has produced 171 tons of black copper, averaging 86¾ fine, and carrying 120 ounces in silver to the ton. The monetary value of the gross product of copper being $44,460, and the value of the silver $20,420, which, when sold in market, will net the company about $25,000 clear of all expenses; being an average profit of nearly $1,600 per day for the 16 days' run, with the use of a 30-ton smelter only. We are informed that the company has a supply of coke sufficient for all purposes during the present month; during which time it is estimated that the product will be fully 300 tons of copper an average of 10 tons per day, carrying 150 ounces per ton in silver. It is authoritatively stated that, after paying all the expenses of the past winter building sheds, opening the mines, erecting hoisting works, etc.—that on July 15th next, the company will declare a dividend of $45,000, which will make its third during the present year, being an aggregate of $142,000 distributed during the present year among stockholders, as the result of seven months of active running time. Should such dividend be declared the United Verde Copper Co., will be the only copper company in the United States doing so, as even the great producers of Michigan—the Hecla and Calumet—have failed to do so.—*Arizona Miner.*

MECHANICAL PROGRESS.

An Optical Test for Iron and Steel.

The question of distinguishing between iron and steel still engages considerable attention. The *Revue Industrielle*, of Paris, observes that researches are being prosecuted in that country with a view to discover some simple method of examination, which will serve for the recognition of cast metal. The importance of this question, both from the trading and technical standpoints, is universally recognized wherever people who pay for steel wish to see that they get it; but it is peculiarly pressing in all protectionist countries, where differential duties are imposed on various brands of iron and its varieties.

M. Alfred Evrard, Director of the Firminy Steel Works, has carefully studied the matter, and has presented the results of his observations to the French Society of Mineral Industry. The French Ironmasters' Association admit that the word "steel" is to be attributed not only to products not cast, which take a temper, but also to all cast malleable products, whether they are susceptible of tempering or not. According to this definition, there is no such thing as cast malleable iron. The question resolves itself, therefore, into one of detecting, by some reliable process, the traces of welding in welded products.

A series of striking experiments was conducted with this object at Firminy. A number of lengths of iron and steel wire of different qualities were cut into pieces, reunited, heated together in a forge to a yellow oxidizing temperature, and tempered in cold water. After this operation the wire was heated again to a cherry red, then well hammered, and finally beaten into a flat band of from 0.1 to 0.8 millimeter thick. If, during its handling, the wire cooled, it was reheated. The drawing out accomplished, the portion drawn was again returned to the fire, heated to an oxidizing yellow, at which temperature it was kept for a minute, and then very slowly cooled in the fire. When it became reduced to dark red, the metal was plunged into cold water. The sheets were afterward polished on both sides, a bright finish not being desired, but only so much of the metal removed to obliterate all trace of the oxidation produced by the intense heat. This operation suffices to show the lines of severance of iron in welded samples; but it is insufficient to absolutely distinguish the metal, if produced from blooms.

After being polished, the sheets were dipped in nitric acid, in order to show the grain of the metal under this energetic attack. The result showed that steel has a uniform surface, and preserves a gray appearance; the attack of the acid bit into the metal equally all over the surface. Iron, on the contrary, showed a rough surface, the attack of the acid being very irregular. The metal showed brilliant characteristic grains ranged in longitudinal lines beside other portions showing a gray surface like steel. The "bloomed" iron also showed black bands, due to contained impurities. The welds of mixed irons appeared very prominent. The distinctive character which permits of the recognition of a welded from a cast product is the appearance of a brilliant shining spicule. In the bloomed metal these are very numerous, and form broken longitudinal lines. In fagoted bars these bands follow the welds all along their length. Another experiment conclusively showed that the presence of bright spicule is due to welds.

A number of bars of extra soft cast steel were welded like iron, and afterward drawn out into a sheet, as already described, when not a trace of welding rings appeared until the acid test was applied, which immediately distinguished them by lines of brilliant spicule perfectly separable in appearance from the gray metal in which they appeared. Thus the presence of lines of bright grains in metal is due to welding; they enable us to distinguish clearly between a product welded and a product of casting—that is to say, to distinguish between iron and steel.

Any user of metal can employ the proceeding already described—to roughly polish the surface of a suspected metal (a sample flattened under the hammer, if possible), and test it with acid for bright lines. M. Evrard, however, adds a few remarks on the *rationale* of the process, as carried out at Firminy. The first operation—the tempering of the iron at an oxidizing yellow heat—was to open the welds of the metal. The wires of hard steel broke under this treatment. The second operation the forging of the wires—like the preceding, opened the metal, which, spread into thin sheets, offered a large surface for examination. The third operation—reheating and tempering of the sheets—by keeping the metal at a yellow heat for a certain time, the texture taken by it under the hammer was destroyed, and it was caused to crystallize in large grains. The tempering at dark red rendered the welds visible. For the the fourth operation—the acid test—it is necessary that the samples should be polished on the surface, in order that the test should be equal at all points. The test should also be a severe one; and in order to secure this, the following arrangement might be made: The samples should be placed in a glass jar, partly filled with nitric acid of from 10 to 15° Baume. The attack by the acid is at first very energetic, and after exposure in this way for ten or fifteen minutes, the samples may be withdrawn, washed in water, and immediately wiped dry. The volume of dilute acid should not be too large in comparison with the samples, or it will not rise sufficiently in temperature to act in the strongest possible way upon the metal. These operations require neither laboratory nor skilled operator; they are applicable to all the descriptions of iron or steel samples, from the finest wire to pieces cut from structural bars; and they furnish certain and indisputable results.

Steam at Three Thousand Pounds Pressure.

Jacob Perkins, an American in England, was the father of the high-pressure system of heating by hot water in closed circuits, early gave his attention to the immense power of steam at high pressure for the projection of missiles of war, and so far perfected a steam gun as to exhibit it before the Duke of Wellington in 1824. It was very effective, but the "Iron Duke" considered that a steam boiler that threw away balls as fast as that did would be out of place in an army, and would waste ammunition. From this, steam as a high-pressure power has slumbered, with occasional revivals, for more than a half century.

About 1840 a steam rifle made by Perkins was brought to the United States, and exhibited at New York. It consisted of a steel barrel of medium rifle size, a lever valve, bullet magazine, with a revolving plug arranged for feeding single bullets or a volley. The whole swiveled upon a substantial frame.

The steam generator was of the vertical tubular shape—a strong, wrought-iron, 3-inch tube, within which were eight smaller tubes. The chamber of the large tube was connected with the valve chamber of the gun.

A small hydraulic pump, worked by hand, served to feed the generator with the water required for steam; the whole apparatus being very compact, occupying but a few square feet of floor.

A cast-iron target a hundred feet away completed the plant.

The closed circulation of hot water from the coil in the furnace through the small tubes in the generator carried the pressure up to a thousand and more pounds to the square inch in a few minutes, and would set the safety valve singing in a tone unknown at ordinary pressures. Under this pressure no water issued from the tiny apertures of the gauge cocks; a blue vapor could be discerned, the tone giving the indication of steam or water.

The safety valve upon the generating or circulating coil was set at three thousand pounds to the square inch, and would sometimes blow off when the gun was not in action, or the water low in the generator.

The heat of water in the circulating coil was so great as to immediately blue the surface of the pipe when freshly scraped near its entrance to the generator, and would fire pieces of pine instantly.

The heat of the steam in the gun chamber frequently melted the bullets, and rendered volley firing very difficult; for on more than one occasion the whole volley was melted in the chamber by the sticking of the first bullet. The report from this discharge much resembled that of the ordinary rifle, with perhaps less sharpness.

The bullets fell from the iron target in dust, when thrown at the highest pressure; while from lower pressure they were hattered into all shapes, from cones to flat ragged disks.

A peculiar feature of that high pressure steam apparatus with the necessarily high temperature of its active element was the entire absence of any form of packing; every joint was a metallic contact, and the valves of hardened steel with seats of the hardest bronze.—*Scientific American.*

ALL ABOUT DRILLS.—One of our cotemporaries answers certain questions about drills as follows: What is considered to be the best speed for drills in cast iron, wrought iron, machinery steel and tool steel? A. The speed depends upon the size of the drill and the condition of the material. The fastest speed we ever used was 1,600 revolutions for a drill of No. 18 steel wire. Machinery steel can be drilled at a higher speed than cast iron, wrought iron or tool steel. The question cannot be answered definitely unless the size of the drill and the shape of the drill are given. 2. Does the increase twist of a drill take out the chips faster than the regular twist? A. The gain twist of a drill is an advantage in the rapid removal of chips, especially in wet work—oil or soda water. But the drill should have not only gain twist, but increased width of score, to act well. 2. How much more duty does a twist drill do than the old-fashioned flat drill? A. The twist drill is generally at least twice as effective as the flat drill, requiring less pressure for its work and clearing itself of chips. In some instances it will do fourfold more work than the flat drill.

FATE OF THE IRON RAIL.—The almost complete extinction of the iron rail trade is shown by the enormous fall in the exports of that class of rails. A few years ago, the bulk of the rail exports was declared as iron rails, but the special return issued by the Board of Trade shows that they now form a very small per centage of the total. Only the iron rails manufactured exceeded in quantity the steel rails, but since that time the proportion of the latter has been rapidly increasing four years since.

SCIENTIFIC PROGRESS.

Atmospheric Waves From Krakatoa.

One of the most remarkable facts connected with the great earthquake at Krakatoa was an atmospheric wave which, according to *Nature*, travelled no less than three und a quarter times around the whole circumference of the globe. They were not second waves, but huge aerial, gravity-waves, due to the enormous displacement of air, produced by the ejection of vast volumes of gaseous products into the atmosphere at the time of the volcanic explosion. They were analagous to the great earthquake water-waves that are sometimes transmitted thousands of miles across the widest oceans.

An interesting point in this connection, cited by Prof. John LeConnt, of Berkeley, in a communication to *Science*, of June 13th, and one which he says needs elucidation "is the fact, established by the observations of Gen. Strachey, Prof. Forster, and others, that the velocity of these waves was approximately the same as that of an elastic sound-wave in air. It is the near coincidence of these velocities which has led to the confounding of these gravity-waves with elastic sound-waves. The approximate identity of the velocities in these two cases may be traced to the relation existing between the elasticity or resilience of the air, on which the velocity of sound depends, and the hight of a homogenous atmosphere, on which the velocity of long aerial gravity-waves depends.

It is well known that the mathematical investigations of Sir G. B. Airy and others, confirmed by the experimental results of Scott Russell, show, that, in the class of water-waves in which the wave-length bears a large ratio to the mean depth of the water, the velocity of propagation of the wave is sensibly equal to the velocity acquired by a heavy body in falling vertically *in vacuo*, under the action of gravity, through half the mean depth of the water. Now, it is highly probable, that, notwithstanding the variable density of the atmosphere with altitude above the surface of the earth, the same formula is applicable to long gravity-waves propagated in it; viz., that the velocity of the wave is equal to that which a heavy body would require in falling vertically through half the hight of a homogeneous atmosphere.

The same number of *Science* contains a lengthy extract from the log of a ship which was sailing in close proximity to the scene of the earthquake on the day of its occurrence. The following condensation will be of interest:

Aug. 27.—Commences with strong breezes, and thick, cloudy weather. Barometer 30.12. At 9.30 A. M. pilot left ship. Hove the lead every fifteen minutes. At daylight noticed a heavy bank to the westward, which continued to rise; and, the sun becoming obscured, it commenced to grow dark. The barometer fell suddenly to 29.50, and suddenly rose to 30.60. Called all hands, furled everything securely, and let go the port anchor with all the chain in the locker. By this time the squall struck us with terrific force, and we let go starboard anchor with eighty fathoms chain. With the squall came a heavy shower of ashes and sand, and it had become by this time darker than the darkest night. The barometer continued to rise and fall an inch at a time. The wind was blowing a hurricane, but the water kept very smooth. A heavy rumbling with reports like thunder, was heard continually; and the sky was lit up with fork lightning running in all directions, while a strong smell of sulphur pervaded the air, making it difficult to breathe. Altogether, it formed one of the wildest and most awful scenes imaginable. The whole ship, rigging and masts, were covered with sand and ashes to the depth of several inches.

Aug. 28.—Commences with light airs, and thick, smoky weather. Hove up starboard anchor, and hove short on port anchor. Dead calm throughout the day and night. Saw large quantities of trees and dead fishes floating by with the tide; the water having a whitish appearance, and covered with ashes. This day ends with a dead calm, and thick, smoky weather.

Aug. 29.—This day commences with calms, and thick, smoky weather. Made all sail throughout the day. Moderate winds, and thick, smoky weather. Passed large quantities of driftwood, cocoanuts and dead fishes. At 8 P. M. passed Anjier [all of which, except the foundation of the lighthouse, was destroyed by the tidal wave], and could see no light in the lighthouse, and no signs of life on shore. Furled all light sails, and stood under easy sail throughout the night.

Aug. 30.—Commences with moderate winds and cloudy weather. At daylight made all sail with a fresh breeze from the westward. Found the water for miles filled with large trees and driftwood, it being almost impossible to steer clear of them. Also passed large numbers of dead bodies and fish. Kept a sharp lookout on the forecastle throughout the day.

CAUSE OF EARTHQUAKES.—Dauhree, in discussing the recent earthquakes in Europe and Asia, presents many objections to the theory of falling rocks in internal chasms, and thinks that all the phenomena can be satisfactorily explained by the action of superheated steam. He refers to the well-known craters of explosion, such as Lake Pavin, in Auvergne, where the stratified rocks have been cut sharply through, as if by a punch. The modern experiments with gun cotton, nitro-glycerine and dynamite have often shown pressures of more than 6,000 atmospheres, and produced results which could hardly be wrought by the pressure of weights 600,000 times as great as that of the explosives. Superheated steam, when set in movement by such simple mechanism as nature often presents, would account for all the action of earthquakes, their violence, their frequent succession, and their recurrence in the same regions for many centuries. It also explains the predilection of earthquakes for regions where there are numerous faults, especially if the dislocations are recent. Earthquakes appear to be, in many instances, like subterranean volcanic eruptions which are smothered because they find no outlets. The motive power of gases, of which we see the gigantic effects in the solar jets or protuberances, appears also to be considerable enough beneath the surface of our planet to explain all the effects of earthquakes. *Comptes Rendus.*

Louis Pasteur's Discoveries.

One of the most renowned of modern investigators is Pasteur, the French scientist. He has made many important discoveries of the germs of disease, which have been reported from time to time. These discoveries have been reported at length not only in the scientific papers, but in the newspapers of the day. Pasteur's latest discovery is that of a cure for hydrophobia. On the 19th ultimo, he read at the Paris Academy of sciences his report on his four years' experimental studies on hydrophobia, and the means, not of eradicating, but of weakening it. He admits that the microbe causing it has not been discovered, though he is sure of its existence, and that it may become again rebellious after it has been transmitted to an organism more favorable to its growth. Thus the virus inoculated from an ass to a rabbit will not kill the latter, but if passed on to another rabbit, and then to dog or man, will be fatal. He observed that in some animals the virus lost, and in others gained force. In the rabbit its power was most visible, whereas the ape was less terribly affected. It therefore occurred to Pasteur that if virus were transmitted from one ape to another it would grow weaker at each inoculation. He took some from a dog's brain and inoculated an ape, which died from its rabid virus. He inoculated a second, and then a third, which was hardly indisposed. The virus so modified was transmitted to a rabbit, in whose body it recovered some strength. It increased in morbid power in a second and third rabbit, and attained the maximum in the fourth. It would thus be seen that virulence was only kept in check by withholding from it good conditions for growth. It would be also seen that it never recovered, when well tamed, its pristine deadliness in a single hound. Pasteur claimed to so completely tame the virus that a dog would, in being rendered refractory to rabies by hypodermic inoculation or trepanning, show no sign of illness.

In the second part of his report, Pasteur explained how the maximum of virulence was certainly attained, by making several guinea-pigs the mediums between rabbits and dogs. He told the academy he had discovered a process by which he can operate with diseased blood on healthy blood, and claims to be able to check the progress of rabies in freshly-bitten dogs or other animals. He asks the academy and the Minister of Public Instruction to appoint a committee to study his proof experiments.

Solar Explosions.

Faye rejects, as fabulous, the velocities of 100 or 150 leagues per second, which seem to be indicated, at the sun's surface, by the prodigious rapidity with which the protuberances are formed, and the partial displacements which are observed in the hydrogen lines. He suggests the great probability that hydrogen, when escaping rapidly into the rare medium which surrounds the photosphere, is at first chilled, on account of its enormous dilatation, and becomes invisible to the spectroscope. Afterwards, under the action of solar radiation, it is reheated in various places, so as to be seen by our instruments. An observer, who should return after a half hour's interval, to contemplate the phenomenon, would find the protuberances wonderfully enlarged, without the hydrogen having been required to transverse enormous spaces in the meanwhile.

Father Seechi saw small isolated clouds, forming and growing simultaneously without visible connection with the chromosphere, apparently in the same way as the clouds which are formed in our own atmosphere, from the vapor which already exists in the air, but which is latent and remains invisible, until a local cooling, or a change of pressure, determines its condensation.

Thollon contends, however, that the velocities which are indicated by each of these phenomena are quantities of the same order, and that their maximum value corresponds to the cometary velocities in the same region. Every movement of luminous matter, which approaches us or recedes from us, undoubtedly produces a displacement of spectral lines. No theory indicates, and no fact demonstrates, that any other cause is fitted for producing the same effect. It is, therefore, very natural to consider such displacement as an indication of movement.

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Passing Events.

This issue of the MINING AND SCIENTIFIC PRESS is the first one of Volume XLIX, which is a first-rate time to renew old subscriptions and send in new ones.

The colliery disaster at British Columbia, an account of which is given elsewhere, is one of those things from which we have been remarkably free on this coast, but the opening of new collieries and extension of deeper workings in old ones will no douht cause them to occur more frequently in the future. It behooves colliery owners on this coast to take advantage of the experience of older coal mining regions and adopt all possible safeguards against accident.

The National Holiday occurring this week has caused a temporary cessation of business, the banks, wholesale houses, Board of Brokers, and many retail establishments closing business for the three consecutive days at the end of the week.

There is little of special interest to note from the mining regions, other than the current news condensed in our "Mining Summary."

SINGULAR CLOUD PHENOMENON.—A singular phenomenon was observed at Bismarck, D. T., last week. There were two clouds, ons above the other. A heavy shower was seen to pour from the upper one, and the cloud below caught every drop of water and absorbed it. Light clouds seemed to come from all directions to catch the shower. The color of the lower cloud changed rapidly, and it expanded from a small summer cloud to a massive rain gatherer. In a few minutes, the upper cloud had entirely disappeared. This was observed through glasses.

Sulphureted Ore for Acid Making.

Since the introduction of our pyrites as a substitute for brimstone in the manufacture of sulphuric acid, the roasting of sulphureted ores in kilns has attained a degree of perfection that its importance warrants. In the large copper works of both England and Germany the possibility of the continuous roasting of matte in kilns has also been demonstrated, but this is dons rather to prevent the destructive influence of sulphurous acid on the surrounding vegetation than with any view of economical roasting, as it is only hy the exercise of the very greatest care and skill that it is possible to keep up a sufficiently lively state of combustion to generate sulphurous acid in large quantities without fusing the whole contsnts of the kiln iuto one solid canker. The kilns may here he considered merely as an apparatus for the desulphurization of *ores*, and as every manager of copper or acid works receives ores and inquiries regarding its fitness for sulphuric acid manufacture, most of the inquiries showing ignorance of the quality of pyrites wanted by acid makers, a few words in this connection will be of interest.

Quantity is the first desideratum. Unless a deposit is of immense size and very accessible, it has uo chance of competing with cheap and good Canadian pyrites, which now nearly controls ths Eastern market. A high percentage of sulphur is also requisite. Forty per cent is a minimum, and ore carrying 45 per cent would possess nearly douhle the value. To contain such an amount of sulphur it must also be free frou gaugue rock. Purity must also be considered. Any appreciable amount of arsenic will condemn pyrites for snlphuric acid manufacture, and admixtures of lead and zinc are more or less deleterious.

The percentage of copper in the pyrites is also highly important. Mr. Edward D. Peters, in an articls in a Government report on this suhject, states that while it is commercially advantageous to have as high a percentage of copper as possible, yet in practice anything over 5 per cent would probahly condemn the ore for the manufacture of acid. It is not alone that the substitution of copper pyrites for irou lowers the sulphur contents of the ore (the latter mineral containing nearly 20 per cent more sulphur than the former), but it also affects the working of tbe burners, and, owing to its fusi bility, greatly increases the difficulty of working.

This is a point particularly wortby of notice. Five per cent of copper is the extreme limit, and three or four psr cent makes it better oro for burning. Mr. Peters calls attention to a very great error often committed, which is attempting to use the mineral known as phyrrhotite or magnetic pyrites in place of the ordinary pyrite or iron pyrites. The difference in behavior of these two minerals in the burners is not alone due to the smaller percentags of sulphur contained in the phyrrhotite, (36 as against 53) hut also from the fact that the pyrite yields up what snlphur it contains with great ease, even if it is so impure as to carry less sulph ur than the pyrrhotite, and burns freely in kilns without going out or melting. The other mineral on the contrary, either scorches on the surface, and thengoes out entirely, or escapes control and melts into a solid mass. Inexperienced persons should not attempt to work this ore. Roasting pyritous ores in kilns helongs to the subject of manufacture of sulphuric acid. The capacity of a single hurner rarely reaches half a ton in 24 hours. Their management requires skill and their coustruction is expensive. On the other hand they work with much less mechanical loss than is experienced in heap washing, and there is no tying up of capital in a two or three months supply of ore.

REV. JOHN I. BLEASDALE died in this city on Saturday. He was a doctor of divinity, having worn his robes at Sydney, in New South Wales. But it was as a chemist that he was best known in this community. He was a man of profound learning and one of the best analytical chemists in the country, and being an enthusiast upon the subject of viticulture and wine-growing, made these his principal studies. He was also a microscopist and had written several treatises, one on gems and precious stones, being particularly notable.

THE Sierra Nevada Company reports a cash balance of $69,441 93, or about two-thirds of what the stock is selling for.

Coal at San Francisco.

There can he no stronger indication of prosperity, evidencing an increass of population and an enlargement of our manufactories, than the fact that our local consumption of coal for the last half year has increased 96,000 tons.

Importers of foreign coals give a doleful account of their imports so far in 1884, they having been singularly unprofitable. Large numhers of English and Australian cargoes, shipped in December and January last, have since arrived here, and were disposed of at from $3,000 to $5,000 per cargo loss. A valid reason can he assigned for these seeming ill-timed shipments. Our rainfall to January 1, 1884, had not reached 4½ inches—a strong prediction for a dry season, which would have insured high quotations for coal; instead, we have had an exceptionally seasonahle rainfall, guarantceing us a large influx of vessels to move our crops, most of which will be coal carriers. Then again, a colliery in Nanaimo, British Columbia, which in 1883 did not ship us auy coal, has so far yielded us 45,240 tons, of an excelleut grade for gas and steam purposes, since January 1st, and the Tacoma and Seattle collieries havs shipped us 50,000 tons in excess of same period of 1883, thus overcoming our increased consumption, and serving to keep the market depressed.

Mr. J. W. Harrison, coal and metal broker of this city, gives in his circular review for the half year the following statistics. The first table is one of prices, which will show the monthly fluctuations of foreign coal for "spot" cargoes.

	Jan.	Feb.	Mar.	Apr.	May.	June.
Australian..	$8 50	$8 25	$8 00	$7 25	$7 12½	$7 25
English steam..	8 00	8 00	8 00	7 00	7 00	7 00
Scotch splint...	9 25	9 00	9 00	8 50	8 00	8 00
West Hartley...	9 50	9 25	9 25	9 00	8 25	8 25
Cardiff.....	8 00	8 00	8 00	7 50	7 25	7 25

There is a better feeling apparent in the quotations made for foreign grades last month, showing an advance of fully 75 cents per ton on some grades over the lowest prices of April and May. As some cargoes of Australian sold under $6 75 per ton, which could now be readily placed at $7 50, and as all the Australian to arrive here within 90 days has already been placed, any change of figures will be an advance within the next three to four months.

The various sources from which we have derived our supplies are as follows:

		1883.	1884.
British Columbia.....	tons.	63,524	111,571
Australia.....		10,511	49,346
England and Wales.....		37,806	37,303
Scotland.....		3,914	5,540
East (Cumberland and Anthracite)..		24,713	16,445
Seattle.....		18,000	65,318
Carbon Hill.....		16,600	74,835
Mount Diablo.....		55,181	38,118
Renton, Coos Bay, South Prairie.....		20,594	37,596
Totals.....		340,846	439,311

The arrivals at Wilmington have been 30,924 tons—20,775 tons Wellington, 8,802 tons Carbon Hill, and 1,347 tons Wallsend.

The outlook is very encouraging for a further increase of consumption during the next six months, as the winter season interveues, causing large sales of coal for domestic purposes, and it is safs to predict that present prices will be fully sustained.

A BIG MINING SALE.—The Reno *Gazette* says: "J. W. E. Townsend received a letter from John I. Ginn, in which he says that Kemp & Butterfield have sold a group of mines in Mill Creek for $1,500,000. They have raised a working fund of $300,000. Mr. Butterfield is to act as superintendent. He also says the tunnel has entered the Sheepherder lode, but the public is not informed of the result."

DURING the past month local incorporations disbursed $336,326 in dividends, as follows: Banks $5,000, gas and water $46,000, insurance $9,000, street railroads $19,500, powder $22,760, mining $204,716 and miscellaneous $29,350. The total for a corresponding month in 1883 was $223,250.

HALE & NORCROSS has about $60,000 on hand in cash, besides the hullion sent to the Carson Mint—value not yet known. Savage has nearly $34,000 on hand, Chollar $25,000 on hand, and Potosi, which is overdrawn about $1,000 at hank, has $19,000 to be collected on the assessment.

THE miners who appropriated rich ore at the Buchanan mine, Tuolumne county, have been sent to the State Prison—one for five and the other for eight years. This example should be a warning to miners not to carry off ore from their employers.

OPHIR is in good financial condition, with $63,702 87 in the treasury.

Patriotism and its Duties.

The annual recurrence of the Fourth of July, carries our minds hack to that hour, when was first deliberately and formally announced the gospel of political liberty. Then hegun the momentous experiment, how far life, liberty, and happiness could be secure under laws made hy those, who were to obey them. Then was ushered among the family of nations a new government destined, soon after the revolutionary struggle had ceased, to crystallize into a constitution, whose central idea is the political equality of all the citizens before the law. Our readers will hardly expect us to lift the veil of time, and bid them look on the sublime spectacle of two millions of people, moved with one accord to assert their rights against the most powerful nation in the world, and following their new-made flag with unshaken confidence, under varying fortunes over many a bloody field, until victory crowned their efforts. The most grateful contribution we can make to their memory, is to be so deeply imbued with their spirit and wisdom, as to know how to perceive and discharge our duty in th spresent, and pass down to posterity the legacy they have left us unimpaired.

In the light of this day, some thoughts on patriotism and the duties it inculcates may not he inappropriate.

What is patriotism? What is American patriotism as distinguished from the patriotic sentiment that glows and animates the bosom of all other people? It is a feeling that should not he confounded, as is often done, with that sentimental instinct, born of association and which hinds one to his native land. Providence has for wise and beneficent reasons imperishahly planted in the bosom of every child a love of home, however homely and unattractive it may be, It had rather live with its own parents in a wood-shed, clad in rags and pinched in hunger, than share the hospitality of strangers as an orphan, though surrounded by all the luxury and elegance that wealth can procure. There is akin to this beautiful filial emotion, an instinctive attachment to the land of our birth, that geographical locality we call our country. It is a sentiment not born of genial skies and fertile acres.

But this beautiful feeling, so often the inspiration of poetry and song, is not the patriotism that should fill our hsarts as we recall the historic memories of this day. It is a feeling shared alike hy the Piute or Dakota Indian for his hunting ground. The patriotism that fired the souls of the Hamdens, Koscinskos, Emmets and Franklins—what was it? A blind instinct which clings to a tree that may have happened to overshadow one's birth-place? Was it for the love of the granite hills of Massachusetts that Warren panted out his life on the hight of Bunker Hill, or that caused the elder Adam to exclaim, as he heard the report of the musketry at Concord and Lexington, "Oh, what a glorious morning is this?" Did Washington draw his sword for the tobacco fields of Virginia, or Marion and Sumptor hide in swamps and live on sweet potatoes for the love of the palmetto groves of Carolina? The inspiration that fired their souls was something purer, deeper, nobler than the brute instinct that attaches one to his native soil.

Indeed, American patriotism is a noble sentiment, that may catch and hurn in the hosom of a man of foreign birth. When the Marquis De Lafayette tendered his sword and fortune to the Colonial Congress, and Baron De Kalb fought and died on the plain of Camden, did they not feel an enthusiasm akin to that which animated the soul of Washington, Hancock and Adams? During our late unhappy civil strife thousands of our forcign population freely left their shops, fields and homes to enlist in our armies, and vied with the native-born in zeal, heroism and loyalty. What was it that inspired them? It is happily expressed by Mr. Lincoln, in his address at Gettysburg, when he said: "Our fathers brought forth upon this continent a new nation, conceived in liberty and dedicated to the proposition that all men are created equal." Patriotism—American patriotism—is an ardent devotion to that idea, to that special system of government by which we are trying to work out the destiny of a mighty people.

THE corrected assessment-roll of San Francisco personal property shows a reduction of $549,455 from the Assessor's figures, making the total suhject to assessment $58,848,832, instead of $59,398,287.

Competitive Trial of Windmills.

Hydraulic engineers and manufacturers of windmills and force pumps will be interested in the proposed competitive trial of windmills, constructed for agricultural purposes, which will be held during the 30th annual exhibition of the Pennsylvania Agricultural Society, at the new State Fair grounds in Philadelphia, September 8th to 20th, inclusive. There are very many forms of windmills, differing in form and arrangements.

That valuable practical information may be gained upon the application of the true principles which govern the construction of such machines, and that the general efficiency of all may be materially improved, the Society invites all manufacturers of windmills to make entries for exhibition and trial, and of lift and force pumps to make full exhibits. A description of mill, including weight of wheel, traverse sweep of wheel and vane, diameter of turn-table, an account of all other appliances sent to be used in the trial, the derrick alone excepted, and the price at which the machine is sold, must accompany the entry.

Mills may be erected at any time after August 1st. They must be in complete running order, and be turned over to the society for preliminary examination and test on the first day of September, at 12 o'clock, noon. The actual trial to begin at 12 o'clock, noon, September 8th.

No mills shall exceed ten feet in diameter from out to out of wings, and all parts and appliances shall be guaranteed by exhibitors to be in all respects exactly similar to those sold in their everyday business, and at the prices named.

Each exhibitor shall erect a derrick to support his mill, the centre of the crank-shaft of which shall be thirty-five feet above the fixed level of water in the supply tank at foot of derrick. The society will furnish free of charge to each exhibitor a uniform style of water-meter, and will require all water to be pumped through it: the outlet of the meter to be twenty-five feet above the level of the water in the supply tank at foot of derrick. The water as it issues from the pump to flow back in full view to the supply tank. The return of the water may be made in such attractive forms as the taste of the exhibitor shall dictate. Mills may be furnished with such automatic appliances and with any kind or style of pump, which the exhibitor shall prefer to provide. When turned over to the committee, the derrick will be boarded up, and all parts of the mill rendered inaccessible, and no part of the mill or its connections can be oiled, packed, or touched in any way or under any pretense whatever, until the conclusion of the twelve days trial. The register of the water-meters will be taken by the judges at the commencement of the trial and daily thereafter, at a fixed hour, until the test shall close at noon on the twentieth day of September. During the period of trial the average velocity of the wind for the twenty-four hours preceding noon of each day will be furnished by the United States Signal Observer. These reports will be posted daily, as also a report of the number of revolutions made by each mill, which records will be taken by apparatus supplied by the Society and affixed to each mill.

At the conclusion of the trial, the judges will make a comprehensive report, stating to what manufacturers invitations to compete were sent, what entries were made, and mills were erected for trial. In the order in which the entries were received, description of each mill with illustrations if furnished, will be given. Also a statement of the number of revolutions of the wheel, mechanical condition of the parts, kind of pump used, number of gallons pumped, and such other items of interest as may be deemed worthy of note. No special references commendatory or deprecatory of any one mill will be made, the report dealing with results alone.

No premiums of money, medals or diplomas are offered. Awards will be in the form of written reports attested by the signatures of the judges. California is a great country for windmills, and no doubt several of our inventors will wish to compete in this trial.

THE San Francisco License Collector reports expenses for June, 1884, at $29,339.90, as against $26,500 for June, 1883; receipts for 1883-84, $446,537.05, as against $416,593.75 for 1882-83. An additional $3,854.70 has been received for the State Mining Bureau.

Measurement and Flow of Water in Ditches.

[Read before the Technical Society of the Pacific Coast, June, 1884, by ARTHUR J. BOWIE, JR.]

In California, where the rainfall over large portions of the State is small and periods of drought of not uncommon occurrence, the development of the agricultural as well as the mining interests, necessarily resulting from the continued influx of population, will be dependent greatly upon the careful husbanding of the water supply. The sources of this supply are comparatively limited, and the problem of systematic irrigation will grow daily in importance from the necessities of the farmers; and the demand for water will steadily increase with the more extended cultivation of the soil.

The costs of construction and maintenance of the necessary canals and ditches (depending principally on their capacity) will be of prime importance to the owners, who will appreciate fully the value of a correct determination of the flow of water. The easy-going farmer who purchases the water, will ultimately discover the necessity of knowing how much he is receiving, and then will come the demand for a standard of measurement of water.

The history of northern Italy from the fourteenth to the eighteenth century, is replete with accounts of disputes and difficulties arising from the non-existence of some accepted standard of measurement of water. Similar troubles have arised at times in the mining regions of this country, as can be attested by numerous court reports.

With the experiences of the past, and in consideration of the future interests of the country, it would seem advisable that some uniform gauge and standard of measurement of water should be adopted.

The miner's inch has only led to confusion and is the relict of the Mexican and Spaniard, who possibly took it from the Italian. Like the Italian oncia, which varied in nearly every province, so its brother, the miner's inch has followed suit to even varying in the same district.

In the construction of the various water supply systems for the different placer regions in this State, certain experience in the measurement and flow of water has been acquired, and it has been considered of sufficient import to place some of the results of this work on record, with a view of assisting in clearing up the miner's inch, and giving to those interested in the profession the benefits derived from the several works.

The Miner's Inch.

The miner's inch of water is a quantity which varies in almost every district in the State; no one gauge has been uniformly adopted, nor has any established pressure been agreed on, under which the water shall be measured. In some counties there are 10, 11 or 12 hour inches, and in others there is a 24 hour inch. The apertures through which the water is measured are generally rectangular, but vary greatly in width and length, being from 1 to 12 inches wide and from a few inches to several feet long. The discharges are through 1', 1½' 2', and 3 inch planks, with square or with square and chamfered edges, combined or not, as the case may be. The bottoms of the openings are sometimes flush with the bottoms of the boxes, sometimes raised above them. The head may denote the distance above the center of the aperture, or again that above the top, and varies from 4½ inches to 12 inches above the center of the aperture.

The Smartsville inch is calculated from a discharge through a four-inch orifice with a seven inch board top; that is to say, the head is seven inches above the opening, or nine inches above the center. The bottom of the aperture is on a level with the bottom of the box, and the board which regulates the pressure is a plank one inch thick and seven inches deep. Thus, an opening 250 inches long and four inches wide, with a pressure of seven inches above the top of the orifice, will discharge 1,000 Smartsville miner's inches. Each square inch of the opening will discharge 1.76 cubic feet per minute, which approximates the discharge per inch of a two-inch orifice through a three-inch plank with a head of nine inches above the center of the opening, the said discharge being 1.78 cubic feet per minute. The Smartsville miner's inch will discharge 2,534.40 feet in twenty-four hours, though in that district the inch is only reckoned for eleven hours.

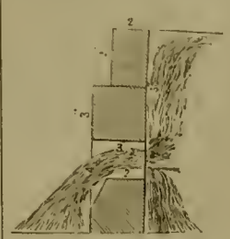

Fig. 1.—Miner's Inch.

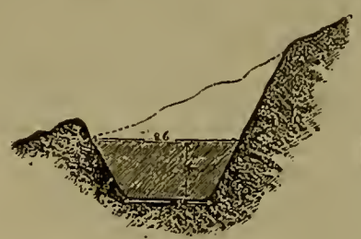

Fig. 2.—North Bloomfield Main Ditch.

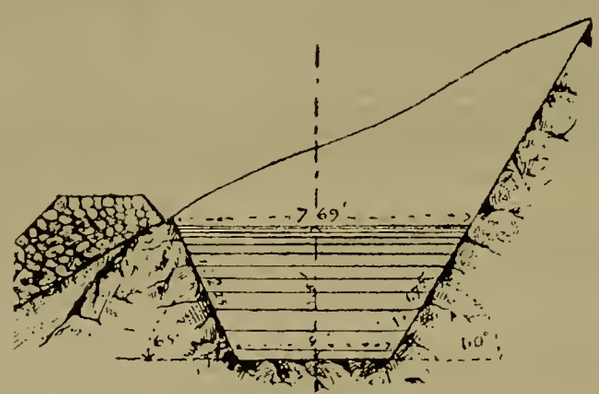

Fig. 3.—Section of Milton Ditch.

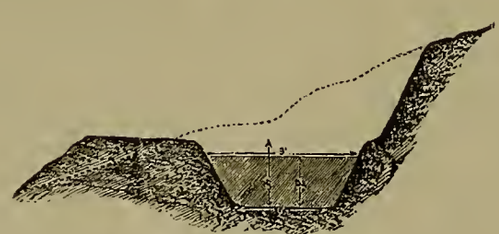

Fig. 4.—Section of La Grange Ditch.

Other Inches.

The miner's inch of the Park Canal and Mining Company, in El Dorado county, discharges 1.39 (*a*) cubic feet of water per minute. The The inch of the South Yuba Canal Company is computed from a discharge through a 2-inch aperture over a 1½-inch plank with a head of 6 inches above the center of the orifice.

At the North Bloomfield, Milton and La Grange mines the inch has been calculated from a discharge through an opening 50 inches long and 2 inches wide, through a 3-inch plank (outer inch chamfered), with the water 7 inches above the center of the opening.

Determination of the Inch Experiments at Columbia Hill.

To determine the value of this miner's inch, a series of experiments was made at Columbia Hill, latitude 39 N., elevation 2,900 feet above the sea level. The *module* used was a rectangular slit 50 inches long and 2 inches wide; head 7 inches above the center of the opening. The discharge was over a 3-inch plank, the outer inch chamfered, as shown in Fig. 1.

The size of the opening was taken with a measure (micrometer attached) which had been compared with and adjusted to a standard United States yard. Time was read to one fifth of a second; the level of the water (drawn from a large reservoir) was determined with Boyden's hook, micrometer adjustment. The following results were obtained:

One miner's inch will discharge in 1 sec.,	.026 cub. ft.
One miner's inch will discharge in 1 min.,	1.57 cub. ft.
One miner's inch will discharge in 1 hour,	94.2 cub. ft.
One miner's inch will discharge in 24 hrs.,	2,260.8 cub. ft.

The coefficient of efflux is 61.6 per cent. These figures are within the limit of 1-500 possible error (*b*).

As the 2-inch aperture requires too much space for gauging large quantities of water, custom has changed the form of the module, and an aperture 12 inches high by 12¾ inches wide, through a 1½-inch plank, with a head of 6 inches above the top of the discbarge, is now used. These openings discharge what is accepted as 200 miner's inches.

A series of experiments was made at La Grange, Stanislaus county, California, latitude 37° 41' N., elevation 216 feet above the level of the sea, to determine the value of the inch thus delivered in the claims. The results here given are the mean of a series of gaugings taken from 9 different apertures, discharging in the aggregate 1,800 miner's inches.

The water was drawn directly from a flume and discharged into a small reservoir, across the lower end of which was fitted a gauge. The velocity of the water issuing from the flume was broken by several drops as it entered the reservoir, and the gauge at the lower end was raised sufficiently to prevent any flow due to an increased velocity which might have been acquired in the flume.

The level of the water was determined with a Boyden's hook.

The discharge from the module was caught in a flume and conducted to a box fitted and leveled for the purpose. Time was read to one-fifth of a second. The following results were obtained:

One miner's inch discharged in 1 sec.,	.02499 cubic ft.
One miner's inch discharged in 1 min.	1.4994 cubic ft.
One miner's inch discharged in 1 hour	89.9640 cubic ft.
One miner's inch discharged in 24 hrs.	2,159.1460 cubic ft.

Effective coefficient of efflux, 59.05 per cent (*c*).

An experiment on a single aperture of this form, made by Hamilton Smith, Jr., gave a discharge of 2,179.4 cubic feet per miner's inch in 24 hours. The 2,230 cubic feet of the North Bloomfield inch can only be considered an assumed rough estimate of discharge in 24 hours for 1 miner's inch.

The theoretical velocity in feet per second of a fluid flowing into the air through openings in the bottoms or sides of a vessel or reservoir, the surface level of which is kept constantly at the same hight, is equal to that which a heavy body would acquire in falling through a space equal to the depth of the opening below the surface of the fluid, and is expressed as follows:

$$v = \sqrt{2gh}.$$

In which v = velocity in feet per second.
g = the acceleration of gravity.
h = the hight fallen in feet.

This is called Torricelli's theorem, which supposes indefinitely small orifices with thin sides,

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(*a*) Estimated by J. J. Crawford, M. E. (*b*) The experiments were made in 1874, by H. Smith, Jr., C. E.
(*c*) The experiments were made by the author.

and assumes that the upper surface of the water and the orifices are under the same conditions as regards atmospheric pressure. Conditions and size of sectional area of the aperture, friction, resistance of the air to motion and pressure of the atmosphere, are all neglected.

The value of g varies in different latitudes, but for all practical purposes is taken as equal to 32.2.

$$\text{The theoretical head} = \frac{v^2}{2g}$$

The acceleration of gravity at latitude 45° = 32.17 feet per second, being represented by g, for any other latitude, l.

$$g' = g\ (1 - O.\ 002588\ \cos 2l)\ (d).$$

If g represents the acceleration of gravity at that hight, h and r the radius of the earth, the acceleration of gravity at the level of the sea equals—

$$g' = g\left(1 + \frac{5h}{4r}\right)$$

Flow of Water in Open Channels.

There is no generally accepted formula for determining the velocity of water in open channels. The tables based on the old formulas published prior to the works of D'Arcy and Bazin in France, and of Humphreys and Abbot in the United States, being founded on data which ignore the important factor of the nature of the bed and the sides of the channel, have proved unsatisfactory. Hydraulic engineers have been compelled to rely for correctness of calculated result on the application of a combination of a few known laws with experimental data, which latter, though all important, have been too restricted for the deduction of reliable mathematical theory.

The formulas, in terms of dimensions of cross section and slope, are based upon the supposition of either "permanent" or "uniform" motion. Permanent motion approaches the condition of streams, permits changes of cross section and slope of the water surface, excepting sudden bends, causing eddies and undulations, but demands that the discharge from the different sections should be identical. Uniform motion, in addition, requires an invariable cross section and constant slope of the fluid-surface. The general formulas based on permanent motion differ from those restricted to uniform motion, "by taking into account changes of living force produced by changes of cross section at the different points" (*e*). If these variations are unknown, the difference between the formulas disappears.

Chezy considered that the resistances encountered by water in uniform motion were in direct proportion to the length of the wetted perimeter to the length of the channel and to the square of the mean velocity, from which he deduced the formula.

$$v = c\sqrt{rs}.$$

v Is the mean velocity in feet per second.

c A coefficient taken at a constant value.

r The mean hydraulic radius in feet.

s The fall of surface in a unit of length.

The equation indicates the relation of the mean velocity to the slope and the mean hydraulic radius. The value of the coefficient c has been demonstrated empirically to have a wide range. This formula, however, has been considered the simplest, and has been used by many engineers, different values being given to c, varying from 84 to 100 for large streams. "Though there is abundant evidence," says Higham (p. 5), "that the latter is much too high for low values of r in earthen channels, and that 100 is too low for very large rivers, as high a value as 254.4 having been deduced from the Mississippi observations."

D'Arcy and Bazin, by their experiments on channels of moderate section with limited variation of grades, proved that the coefficient c involved not only r and s, but also a constant for the different degrees of roughness of the channel, the formula being applicable within certain limits of inclination and values of r.

Humphreys and Abbot make the velocity vary with the fourth root of the inclination, while Hagan assumes the velocity to vary with the sixth root.

Ganguillet and Kutter considered that the Chezy formula, $v = c\sqrt{rs}$, was the correct point of departure, but that the coefficient should be made variable, involving not only r and s, but likewise the degree of roughness in the bed or channel.

Ditches in California.

In the mining districts of California ditches are constructed boldly with steep grades and on irregular lines with numerous sharp curves. The cross sections, originally uniform, become more or less varied. Absorption, percolation, evaporation and leakage reduce the flow. A distinct reliable factor for each of these sources of loss cannot well be incorporated in the coefficient of the discharge. If, then, it is intended to cover all of these common sources of loss by such a coefficient, its value must be a material modification of values given commonly in the text-books. It would be certainly an affectation of accuracy to apply so complicated a formula as that of Kutter in such a case, since the modifying conditions which can be estimated but roughly, call for a large reduction of the calculated result. This will be apparent from the measurements of discharge given further on. The simple formula, $Q = a\,c\sqrt{rs}$, expresses more fitly the result of experience in such cases, wherein—

Q is the quantity of water which the ditch is capable of carrying in cubic feet per second.

a The effective area of cross section of ditch as constructed originally, in square feet.

r The hydraulic mean depth in feet.

s The fall of surface in a unit of length.

c A coefficient covering all common losses.

Examples of Value of Coefficient in Ditches.

In its application to the North Bloomfield Main Ditch (*f*) (length 40 miles, sectional area 23.89 square feet, grade 16 feet per mile), with its abrupt turns and sinuous course, the value of the coefficient c, as determined, varies from 44.7 to 37.7, in accordance with the season of the year.

The Texas Creek (*g*) branch ditch is about seven-tenths of a mile long. Its sectional area is 13.5 feet, and the grade is 20 feet per mile. The sides are rough and the curves are sharp. With a flow of 32.8 cubic feet per second, the ditch runs about full. The value of $c = 33$. In connection with this ditch there is a rectangular flume 2'.67 wide x 2'.83 deep, made of unplaned boards, set on a grade of 32 feet per mile. The flume has some sharp but regular curves, and the water from the ditch runs it nearly full at these points. With the discharge 32.8 cubic feet per second, $c = 39$.

On the Milton line, from Milton to Eureka, a distance of 19.4 miles, the sectional area of the ditch is 20.39 square feet; grade 19.2 feet per mile for the earthwork and 32 feet per mile for flume. The line is very irregular, having many drops and chutes. The distance from Milton to the measuring box at Bloody Run is 29½ miles. The minimum established grade for the last 10.1 miles was 16 feet per mile, with a sectional area for the ditch of 23.05 square feet. The coefficient c determined from the gauging at the measuring box has varied from 22 in its leakiest condition to 31, which latter can be taken as correct for the present condition. In the succeeding 30 miles below the gauge, owing to a better character of ground, the coefficient reaches 41.

The La Grange main ditch, 17 miles long, has a sectional area of 22.5 square feet, and a slope of 7 feet per mile. From the delivery at its Patricksville junction the coefficient c is determined to be 52, but it is based upon the assumption that the depth of the canal is three feet, whereas in the original construction it was supposed to have been made four feet deep; the discharge, therefore, due to such a sectional area would diminish necessarily the ascribed value of c (*h*).

In all these canals, after the artificial banks are well consolidated, the water area is increased beyond the original excavation in the natural ground.

Accuracy cannot be expected in calculating the values of Q for proposed ditches of such character. Important losses must vary in every ditch, depending on the nature of the ground, and the character of the construction of the work, and the season of the year. The feeders along the lines compensate largely for these losses. In order to be safe in estimating the capacity of a ditch, the value of the coefficient c for the dry season should be taken.

The following facts show the magnitude of the losses due to the absorption, leakage, evaporation, etc.:

Three thousand miner's inches of water (a flow of 75 cubic feet per second) turned in during the busy season at the head of the Bloomfield ditch, will deliver 2700 inches (67.5 cubic feet per second) at the gauge 40 miles distant. Twenty-four hundred inches of water (60 cubic feet per second) turned in at the head of the Milton ditch delivered formerly at the gauge, 29½ miles distant, 1450 to 1600 inches (36.25 to 40 cubic feet per second) but at present 2500 inches (62.5 cubic feet per second) turned into the head of the ditch, delivers 2,000 inches (50 cubic feet per second) at the gauge. The exact loss of water between the head of this ditch and the measuring box is shown in the following summary, taken from the official records for the month of August for the years 1875 to 1882, inclusive. This month is taken as a dry month, as prior to that time the numerous side streams swell the amount delivered at the gauge.

RECORD FOR AUGUST.

YEAR.	Water turned at Milton, 24 hours, inches.	Water record at Bloody Run, 24 hours, in.	Per cent.
1875	44,000	34,950	79.4
1876	59,700	42,625	71.3
1877	67,875	44,700	65.9
1878	76,650	58,875	77.4
1879	82,725	51,350	62.0
1880	74,080	55,325	74.7
1881	66,850	48,325	72.3
1882	68,300	50,984	74.4

The Eureka Lake ditch, with 2,500 inches turned in at the head, delivers at the gauge, thirty-three miles distant, about 1800 inches in the dry season.

The above statistics lead to the adoption of values of the co-efficient c, varying from 31 to 45, in estimating the capacity of ditches on heavy grades of forty miles length flowing from sixty to eighty cubic feet per second, such as referred to that is:

$$Q = 31 \text{ to } 45\ a\sqrt{rs}.$$

The loss incurred in the distribution of water is denoted by the following figures taken from the official records of two mining companies. The amount received is measured, at or near the distributing reservoirs; the amount used, at or near the pressure boxes. The difference shows the losses from leakage, evaporation, absorption and wastage arising from excess of constant supply over the amount needed, with interruptions at the claim.

NORTH BLOOMFIELD COMPANY (24-HOUR INCHES).

Year.	Am't Rec'd.	Am't Used.	Loss.
1870 to 1879, inc...	5,838,865	5,504,758	334,107=6
1880	945,550	920,612	24,938 2½
1881 (*i*)	950,340	866,962	83,378=9
1882	1,025,880	1,005,977	19,903=2
1883	862,660	836,251	26,409=3
14 years	9,623,295	9,134,560	488,735=5

MILTON COMPANY (24-HOUR INCHES).

1882	685,933	635,884	50,049=7
1883 (*j*)	446,224	361,877	84,347=19
2 years	1,132,157	997,761	134,396=13

(*i*) Much water run to waste during 4 months, owing to cessation of work caused by litigation. (*j*) English reservoir was destroyed June 18, 1883, from which source the main water supply was obtained.

Bonanza.

Flourishing Idaho District.

A correspondent of the Ketchum *Keystone*, writing from Bonanza Custer Co., Idaho, says: Last year was one of prosperity here, considering the number of people in the district, and this will be fully as good, or better.

The Custer Co.'s Mill

Crushed all the custom ores brought to it consequently there were none shipped to the outside, as heretofore. The mill has thirty stamps, with a capacity of thirty-five tons, and has been running regularly all winter on Unknown and Summit ores, with a yield of $40,000 to $50,000 per month. There is said to be ore sufficient in sight to keep the mill employed till the first of January next, and by that time, in all probability, other ore bodies will be opened on the company's ground or other ledges be purchased with which to keep up the supply of quartz. The Gen. Custer Co. has been very successful in its operations here, and the yield of the mill has been large—not much less, on an average, than one million per year. The bullion contains about one-third gold in value, and has not varied much from this from the start.

The Charles Dickens Mine

Is about the same as ever. The ore in sight is wonderful, not only as regards quantity, but quality. The stopes and levels show well, and the deeper working prove the permanency of the mine. A winze sank 60 feet below the floor of the lower tunnel, with levels run east and west, give a showing of four to six feet of ore, with a high average. Much of the ore sent from the Dickens mine to the Custer mill last season averaged over $400 per ton. The higher grade of ore is stored in the mine, and the lower grade is on the dump and in the ore houses, of which there are 5,000 or 8,000 tons. There are twelve to fifteen men employed in the mine, and huge quantities of ore have been extracted during the past winter. The wages at the mine are yet $4 per day and board, as they always have been. There are three veins on the Dickens location, and each of them rich. The mine is now opened to a depth considerably over 300 feet. Last season the

Montana Mine

On Mt. Estes, had over 400 tons of ore worked in the Custer Co.'s mill, the gross yield of which was $98,000. Twelve to fourteen men have been employed in the mine during the winter. This mine is also over 300 feet deep, and good ore in the bottom.

Another ore producer came to the front last season, namely, the Whale mine. For years this has been believed to be a valuable piece of mining ground, but its true merits were unknown until within a year past. Two rich veins were found on the surface last spring and work commenced at once. Between 35 and 40 tons of ore sent to the Custer mill sampled on an average a little over $400 per ton. The veins are from one to two feet in width, and the ore is spotted with horn silver, and in places shows free gold. It is owned by Jas. Hooper, of the Montana mine, and the Galatian Brothers.

On the Dickens Hill, outside of the Dickens mine, there has been much work going on all winter. The Juliette tunnel (on an east extension of the Charles Dickens vein) is in over 400 feet. Mr. Wm. Toole has the management of this mine, and the work is acknowledged to be a pattern of excellence. Near the Juliette John Carroll is running a tunnel to strike the Daniel O'Connell vein 400 feet from the top of the ledge.

West of Dickens Hill John G. Morrison has kept men at work all winter and spring on Paradise and Wathington ledges. He is now running a hydraulic on the gravel bar on Washington Hill, and getting good pay, with it some very large nuggets.

Aside from the Custer Co's mine, on Custer mountain, there are a large number of promising prospects. Among them the Continental, Lucky Boy, Annie, Gen. Miles, Black, Vishnu, and others too numerous too mention, in most of which are veins of good ore; but at present there is but little work bing done outside of the annual assessments. The camp employs about 250 men.

Outside Camps

Are springing up all around us. Sheep Mountain, forty miles to the west, sent several tons of silver-lead ores to the Bayhorse smelter last fall, and it paid well even at that distance.

Clayton, on the Salmon river, thirty miles from this place, is taking on quite a boom this year. Dave Woods, of the Excelsior mine, Crooks, formerly of the Bayhorse smelter, and others, have bought the Kinnikinic smelter, and are getting ready to start it up on Excelsior and other ores.

The Bayhorse smelting works are running on Ramshorn and Squaw creek ores. There is also considerable good ore out on the head of East Fork that will go to the smelters of the Salmon river.

Nearly all the Stanley Basin country was bought up last season by a Wood River and Nebraska company, and it is the intention to bring in a large ditch from Basin and tributary creeks, with which to work the extensive placers. This will make a lively and permanent camp of Stanley.

There is a new quartz camp struck between Stanley and Cape Horn, and the ores so far assay well. There are places there also that will be worked this season.

On Loon creek there will be more done this season than for years past, both in placers and quartz. Several companies are at work there now.

The Yellow Jacket and Moose Creek gold quartz mines, 50 miles north of Yankee Fork, are paying first rate, and will doubtless make good little camps. Big Lost River is also a promising quartz camp, in this county, and will have a large population before fall.

I think all the Salmon River country is gradually on the improve. The mines are numerous and generally bear development. What we need badly is a wagon road connecting this part of the country with Wood River. There is already a good road to Stanley Basin from your side, and from Stanley to this place is only eighteen miles, and not a very bad country to build a road over. The cost would not be over $15,000.

As a good evidence of the stability of our mining districts, we have but to note the settlement of the farming and grazing lands near them.

THE industrial classes of Germany are in a languishing state and much suffering exists in all the manufacturing districts. The general movement of the working people is in the direction of a small increase of wages, and more especially of a reduction of the hours of labor from twelve to eleven hours a day. The movement is daily widening and strengthening, and a significant fact is that it has the warm support of a large majority of the daily papers of that country.

(*d*) See professional papers, Corps of Engineers, U. S. A., No. 12, page 26. (*e*) Humphreys and Abbot, Mississippi Report, page 207.

(*f*) Increase capacity of this ditch is limited by the pipes across Humbug canyon. (*g*) For details of Texas Creek ditch and flume, see paper by Hamilton Smith, Jr., Transactions Am. Soc. C. E., Vol. XIII, pp. 30-31. (*h*) The grades given in all the above cases, from which the different values of C were calculated, exclude the drops, chutes, flumes, etc.; sectional areas represent minimum cross-sections.

Mining Machine Experiments.

Several very important mining machine experiments have this week been made, in presence of a number of colliery proprietors, Mr. Robson, assistant inspector of mines, and others at Alloa Colliery. Mr. D. Whitcomb, Chicago, arrived in Scotland a month ago, with the view of bringing the "Harrison" improved mining machine before the notice of colliery proprietors He obtained a permission from Mr. Roxburgh, of the Alloa Coal Company to test the machine, and accordingly, he had three introduced into the Wimyhall Pit. Two were taken to the longwall working, and one to the stoop and room, so that a thorough test might be made in moderately soft and hard coals. The machine is adapted for "holing" and cutting, or technically, "shearing" coal, and is worked by compressed air. It weighs 660 lb., and is therefore easily removed from one place to another. The machine, when in operation, requires two men in attendance, and strikes from 190 to 210 blows per minute. The operation is exactly similar to that of a vertical bore. The experiments were considered most satisfactory, and in the longwall the machine repeatedly drove a piece of "holing" six yards in extent in a distance of three feet in twenty minutes, the men in attendance showing less signs of exhaustion than those engaged with the picks. In the stoop-and-room, where the coal is exceedingly hard, the work performed has been remarkable. In a tough fireclay "holing" the machine pierced over and over again a hole 5 ft. square in twenty six minutes, while the "shearing" was cut in a distance of 4 ft. in a coal fully as many feet in thickness in twenty three minutes. Mr. Whitcomb claims that two men and one of his machines can perform as much labor as eight skilled miners. As to the expense, it appears from the experiments in mines, where six machines might be introduced, the wages of three men to each machine would meet all the outlay incurred in every connection, that is to say, that 1s. 6d. per day would meet the expense of the driving power, &c., of each machine. One important feature is the fact that the continual freeing of the wasted air improves considerably the ventilation of the workings. Mr. Roxburgh has signified his intention of introducing the "Harrison" in every seam practicable, and it is expected that other Fife and Clackmannan coalmasters will follow suit.—*Collier Guardian.*

The foreign trade of San Francisco has declined seriously this year, compared with last. The total imports during the last three months are valued at $8,500,000, which is a decrease of nearly $2,500,000, compared with the corresponding months in 1883, and is particularly noticeable in the importations from China and Japan. The countries showing an increase are the Central American States, Tahiti, British Columbia, British East Indies, Australia and New Zealand, the Hawiian Islands, Mexico, Dutch East Indies and Manila all Pacific Coast countries! It should be borne in mind, however, in this connection, that a decrease in foreign imports is not always an evidence of decreased prosperity. It is quite often an evidence of an increase in home production that we are simply multiplying our fields of labor at home.

Idle Coal Miners.—A dispatch from Columbus Ohio, dated the 23d says: "The remainder of the miners in Hocking Valley came out to-day against the reduction of ten cents. Thirty-two mines are now closed including all those of the Ohio Coal Exchange, the Columbus and Hocking Coal and Iron Company, the Upson Coal Company, the Shawnee Valley Coal and Iron Company, the X X mines, Gorslin & Barber's and G. A. Blood's mine. About 5,000 men are thus thrown out of employment, besides those living along the railroad tributary to the coal region. The mines above enumerated embrace all the Hocking Valley and Shawnee fields.

Fire Damp Indicated by the Barometer.—It is well known that the escape of fire-damp in mines is intimately associated with the hight of the barometer, which thus becomes a means of foretelling when such escapes are most likely to occur. But according to M. de Chancourtois, who has brought the matter before the French Academy, the danger is also increased by strain in the earth's ernst causing or opening fissures in the coal; and he therefore proposes to fix sismographic apparatus at the head of every dangerous mine in order to detect these strains and provide additional precautions against the gas.

The Chinese Placer Miners.—The Virginia *Enterprise* says that several gangs of Chinese are engaged in mining on Gold Canyon, between Silver City and Dayton. One company which is at work just above Dayton, is working to the depth of about fifteen feet. The company is in ground never before worked. Bedrock has not yet been reached, yet the gravel pays wages that satisfy the Mongolians.

Severe Tarantula Bite.—J. D. Bentley, a wealthy farmer of Modesto, was bitten by a tarantula the other day, and in about ten minutes afterwards the bite resulted in delirium, and almost in death.

Useful Information.

Storing Furs in Summer.

"When we put furs into storage for the season," said a man recently, "our first care is to beat them thuroughly with rattans to drive the dust out, and get rid of the moth eggs that may have been laid in them or been blown into them from the air This done, they are hung on wire frames that distend them, and put into closets that are lined with tar paper. Moths cannot stand the strong odor of tar, and never live long under its influence. Every three or four weeks the furs are taken from the closets and beaten with rattans; and so, in the course of a season, every article has to be handled at least a dozen times. In old times camphur was used; but it has been discovered that it had a tendency to detract from their color, and make them much lighter in line. I suppose there is something in the dyes used for sable and other dark furs that camphor influences. Old women still use that drug, however, and when you see a sealskin sack or cloak or dolman that shows streaks of gray or a muddy yellow, you can be sure that it has been kept in camphor through the hot weather. The whole secret of keeping furs is to beat all the dust out of them and then keep them in a close closet impregnated with the odor of tar. Another old preventive was pepper, either Cayenne or common black, but this has been abandoned; and some good housekeepers used to keep their furs in tobacco cuttings. I have seen moths flourish in tobacco; and, where I have seen insect powders used, they have sometimes injured the furs in some way, or have been totally useless in guarding them from their bitter foe.

"Another desideratum in storing furs is strict cleanliness. We wash all the closets every Spring with water and common washing soda, and the latter serves to destroy any moth eggs that may have got into the place. Thus our closets are never invaded by the moths, but should we show carelessness for a single week the result would be disastrous. Muffs, collars, and other small articles we keep in boxes, packing with them sufficient tar paper to keep out the moth; and the shelves on which they stand are always kept free from dust."—*Popular Science News.*

How to Cool a Room.

The composing room of the New Orleans *Picayune* is situated in the upper story of its publication house, just under the roof, and in summer is extremely hot. An inspiration seemed to have come to one of the oppressed occupants, and in accordance with it a vertical wooden box was constructed in the corner of the room, with openings at the floor and ceiling, and furnished with a pipe for supplying water at the top, and a pan and drain at the bottom for receiving the flow and carrying it safely away. The supply pipe was bent over the upper end of the shaft, and fitted with a rose like that of a watering pot, so as to deliver a shower of spray instead of a solid stream. On connecting it with the service pipe, the movement of the water was found to cause an active circulation of the air in that part of the room, which was drawn in at the upper opening of the shaft and issued again, cool and fresh, at the floor level. The most surprising thing about the experiment seems to have been the effect of the water in cooling the air to a degree much below its own temperature. With Mississippi water, which, when drawn from the service pipe, indicated a temperature of eighty-four degrees, the air of the room, in which the thermometer at the beginning of the trial stood at ninety-six, was cooled in passing through the length of the shaft to seventy-four degrees, or about twenty degrees below the temperature at which it entered, and ten degrees below that of the water which was used to cool it. Of course the absorption of heat hy the evaporation of a portion of the water, accounts for its refrigerating effect, but the result seems to have been so easily and inexpensively attained, that the experiment would be well worth repeating in other cases.

Frosty Windows and Glycerine.—A very thin coat of glycerine applied on both sides of window glass will prevent any moisture forming thereon, and will stay until it collects so much dust that you cannot see through it; for this reason it should be put on very thin. If used on a looking glass you can shave yourself in an ice house, and the glass will not show your breath. Doctors and dentists use it on small glasses with which they examine the teeth and throat. Surveyors use it on their instruments in foggy weather, and there is no film to obstruct the sight. Locomotive engineers have used it as a preventive of the formation of frost on their cab windows. In fact it can be used anywhere to prevent moisture from forming on anything. It does not injure the usefulness of field glasses, etc. In fact, a small drop of pure glycerine in a small hole in a sheet of brass makes a good lense for a small microscope.

Woodchuck Oil for Leather.—From previous reports, and especially from our own recent observations and experiments, we have come to set a high value upon the oil of the common woodchuck or "ground-hog" for leather. This oil, while having considerable body, seems to have some of the non-drying quality of glycerine, but, unlike it, is not removed by water. An old still harness saturated with this oil early in July last, after going through the hot weather, still remains soft and pliable. The lines were even too greasy to handle well until after a month's drying. An old pair of heavy boots, so stiff as to hurt the feet unbearably, received a good coating of this oil August 1st, on the bottoms and two inches high all around the sides, and they soon became almost as soft and easy to the feet as moccasins. By the way, oiling the soles of boots and shoes renders them more elastic, easier to the feet, and less liable to break and crack and wear out on rough ground and stones, and therefore more durable; and at the same time the oil excludes water and dampness. It is highly esteemed by some hunters for guns. A carpenter commends it for tools. If dealers in harness would keep the oil on sale it will bring a good price whenever its qualities become known, while the opening of a market for the oil would stimulate and hasten the destruction of the pests. We have taken fully two quarts of oil from a full grown, fat, fourteen-pound "chuck."—*Am. Agriculturist.*

New Paint.—At the military port of Brest, a mixture of zinc white with zinc chloride has been used for some time, with good result, in painting wood and metals. It becomes very hard, and can be washed or brushed without injury. It should not be applied, however, in rainy or frosty weather, as it then becomes mealy and scales off easily. Chloride of zinc is not the only salt which possesses the property of forming a mastic by its mixture with zinc white. Sorel long ago indicated the protochlorides of iron, manganese, nickel and cobalt as good bases for mastic. After having verified his views, the authorities of Brest have extended his experiments, and have shown that the sulphate and nitrate of zinc, the sulphate, nitrate and chloride of iron, and the sulphate and nitrate of manganese form good mastics and paints with zinc white.

Luminous Paper.—A foreign contemporary says that a luminous waterproof paper, which may be of use in places not well adapted for the application of the so-called luminous paint, may be made from a mixture of 40 parts pulp, 10 parts phosphorescent powder, 1 part of gelatine, 1 part of potassium bichromate and 10 parts of water.

Brightening Carpets.—Very many devices are in use for brightening carpets at sweeping time. Some people use wet newspapers, torn up into little bits; others use tea grounds. A mixture of Indian meal and salt, sprinkled upon a carpet and brushed off with a stiff broom, is also good.

Good Health.

Sunstroke.

In response to a request from one of our correspondents that we would print some directions for treating sunstroke, we copy the following circular, issued by the New York Board of Health. Sunstroke is caused by excessive heat, and especially if the weather is "muggy." It is more apt to occur on the second, third or fourth day of a heated term than on the first. Loss of sleep, worry, excitement, close sleeping-rooms, debility, abuse of stimulants, predispose to it. It is more apt to attack those working in the sun, and especially between the hours of 11 o'clock in the morning and 4 o'clock in the afternoon. On hot days wear thin clothing. Have as cool sleeping-rooms as possible. Avoid loss of sleep and all unnecessary fatigue. If working indoors, and where there is artificial heat (laundries, etc.), see that the room is well ventilated.

If working in the sun wear a light hat (not black, as it absorbs the heat), straw, etc., and put inside of it, on the head, a wet cloth or a large green leaf; frequently lift the hat from the head and see that the cloth is wet. Do not check perspiration, but drink what water you need to keep it up, as perspiration prevents the body from being over heated. Have, whenever possible, in additional shade, as a thin umbrella when walking, a canvas or board cover when working in the sun. When much fatigued do not go to work, but be excused from work, especially after 11 o'clock in the morning on very hot days, if the work is in the sun. If a feeling of fatigue, dizziness, headache or exhaustion occurs cease work immediately, lie down in a shady and cool place, apply cold cloths to and pour cold water over head and neck. If anyone is overcome by the heat send immediately for the nearest good physician. While waiting for the physician give the person cool drinks of water or cold black tea or cold coffee if able to swallow. If the skin is hot and dry sponge with or pour cold water over the body and limbs, and apply to the head pounded ice wrapped in a towel or other cloth. If there is not ice at hand keep a cold cloth on the head and pour cold water on it as well as on the body. If the person is pale, very faint, and pulse feeble, let him inhale ammonia for a few seconds, or give him a teaspoonful of aromatic spirits of ammonia in two tablespoonfuls of water with a little sugar.

Diluted Milk.—We presume there are differences in the quality of the milk but it would be valuable information to know how much of it is absolutely pure. Few of the complaints are heard in San Francisco that are made against the milkmen of New York, where they have been frequently arrested, and, in a number of instances heavily fined, during the last two or three years, for feeding their cows on sour slops until they have become objects of repulsive disease. But that our milk is diluted needs no expert to decide. It is only necessary to drink a cup of the lacteal fluid to discover that it is misnamed, and should be called whitened water. There is probably no article vended in the market that to a greater extent undergoes the adulterating process. If the water is not mixed with poisonous ingredients, the few gills of milk it contains to the gallon can be drank harmlessly, but with no hope of furnishing any nutrition. Here are the proportions of a fluid termed milk which was submitted to analysis in New York: of water, 88.32 per cent; of fat, 3.06 per cent; of other substances, 8.62 per cent. This analysis was produced in court against a milk vender named Meyer, who was fined $500 for selling the abominable stuff. It was further shown that this so-called milk was liable to produce scrofula, diphtheria and blood poisoning. We have no idea that the deception practised on milk consumers in this city is so great—that is, that it contains foreign poisonous matter as in New York - but this could be better told if we had a competent and honest milk analyzer, for which there is a demand that will be backed by hundreds of families, who know they are paying for a quality of milk which they do not get. Possibly the Board of health has a duty to perform in the premises. *Call.*

Sea Bathing.

Sea-bathing is not a cure-all, yet there are few classes of people to whom it may not bring some benefit. For delicate constitutions and for many of the complaints of debility sea-bathing is a powerful tonic. It is medicinal for many invalids. Of the many persons who are in need of a tonic and strengthening treatment there are few who will not derive some benefit from sea-bathing, provided only that they will make haste slowly and bear in mind the necessary precautions.

The question of the sea temperature is an important one for a safe beginning. The water must be warm enough. A chief source of benefit in sea or river-bathing is indeed, the coolness of the temperature and the consequent healthy glow of warmth caused by the rushing of blood to the skin on leaving the water and the stimulating influence upon the viscera. But all this is too active treatment for the invalid at the beginning. One must be educated up to the tolerance of the cold bath.

At some of the French seaside resorts, and recently at some of our own, as at Marblehead, the excellent plan is followed of giving preparatory baths of warm sea water indoors. It is a good beginning for some very delicate women, who find even the summer heat of the Mediterranean (75 to 80° Fahrenheit) too cool at the outset But whenever this initiation is practiced, it should not be a long one. The artificial warmth of the bath should be lessened day by day until after a moderate time it is reduced nearly to that of the sea, and the patient is proven strong enough to cultivate a more intimate and invigorating acquaintance with old ocean himself.

For this purpose a calm, warm and sunny day should be chosen; a windy day should be particularly avoided, for the evaporation from the clothes and the body is then so rapid as to chill the body both on entering and leaving the water. Never go into a cold bath when you feel cold. This well applies to all bathers, whether strong or delicate. To make it effective, it is desirable to lose no time, after beginning to undress, in getting into the water. The best time of the day is two or three hours after eating, and preferably in the forenoon. It may be borne in mind that the beach and the waves themselves are generally cleaner during the ebb tide than during the flood, and it is desirable that the air should be warm as well as the sea. The sun being well out, the first bath from the beach may be taken, and it should be a very brief one, lasting no longer than is necessary to wet the body from head to foot. On leaving the water the bather should strip and be rubbed dry, and this immediately. Indolent bathers run more risk by lingering and shivering in their wet clothes than from any amount of swimming.

Decay of the Bones. This is a terrible disease; the shrinking and ultimate decay of the bones of the human system. It is usually, if not always, a result of insufficient or improper nourishment during childhood. It is a disease which, when it has once attacked the system, cannot be eradicated by any diet or medicine that may subsequently be taken. Unfamiliar as this disease is it is so common in London and some other portions of England, that the frequent cases exposed at the clinics attract no special attention. It is almost unknown in this country.

Brain Wear.—So far from being injured by severe labor, carried on under normal conditions, the brain is improved by it. Mental activity, like muscular exercise, keeps the brain in a healthy state. When, therefore, a man says he is suffering from the effects of mental overwork, I want to know what his views are. Worry may be one of these; worry is exhausting. The worries of life do infinitely more harm than the work of life, howsoever onerous it may be.—*Dr. R. Bartholow.*

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Butte.

BIG BEND.—Butte *Record*, June 28: Work on this tunnel has now been in progress some 19 months. The total distance to be made is 12,007 ft. The tunnel is now in, or will be at the end of the present month a distance of one mile, or 5,280 ft. It will thus be seen that the company have yet much work to accomplish before reaching the river where they propose to erect their dam for the purpose of turning the river into the flume. We understand they are now at work in soft rock, and expect to make good progress for sometime.

El Dorado.

INEZ.—*Mountain Democrat*, June 26: A New York company has taken hold of the Inez mine at Nashville, with T. F. Kay as Supt., and work will be vigorously prosecuted and the mine thoroughly devloped. This mine has been worked to a depth of 200 ft, and promises well. The company now is erecting some of the finest hoisting machinery ever brought to the country.

GRAND VICTORY MINE.—Cor. *Mountain Democrat*, June 26: It has been rumored for several years by local experts, that we have no mine here. The Grand Victory mine has produced in bullion nearly a quarter of million dollars from the croppings of the ledge, no greater depth than fifty ft being attained to produce the above large amount of bullion. In the fall of 1880, a superb and highly-finished 50-stamp mill was built on the mine, supplied with every known modern appliance for the saving of labor. This mill now is in better condition than it was three years ago. It has been proved beyond all argument that the ore body is continuous. It is likely the Grand Victory ore body stands without a parallel in the history of mining in this county, for never was so large a body of gold-bearing ore discovered. And for information of croakers, I will say my lease of the mine does not expire till late in the present fall, and it appears at present there is very little danger of the property laying idle. Fifty stamps are now at work and will continue to do so as long as the water supply may last, and the elements permit. The mine was bonded to the writer July 11, 1881, and subsequently leased to the same party. When the property passed over to the present management, a new system was adopted. All men employed, and merchants supplying the mine, were informed that the 10th of each month would be established as pay day. Each man has been paid for every lick he struck, and every merchant who presented his account on each pay day has met the same result, whether bullion has been produced or otherwise, and we still intend to continue to do likewise.

Inyo.

SLATE RANGE.—Inyo *Independent*, June 28: Dr. A. P. Whittell returned to the State Range yesterday and will soon start up the mill on ore already on the dump, of which there is considerable.

CHANGE OF MANAGEMENT.—We are informed that A. P. Minear has taken charge of the Elna furnace and will start up shortly on Pine Mountain ore.

Mono.

BODIE CON.—*Free Press*, June 30: During the past week 500 tons of ore was worked at the mills. The average assay value of the pulp was $12.85, and that of the tailings $1.85. The Bodie mill finished crushing ore on Friday morning. They will commence working tailings on Monday. The south drift on the 550-foot level of the Fortunia is in 40 ft. Upraise on the Gildea, 432-foot level, is up 20 ft. North drift from upraise No. 4, 300-foot level, is in 95 ft. South drift from same is in 15 ft. The rich ore above the 306-foot level has pinched out. No change to note in any other place in the mine.

STANDARD CON.—They extracted and shipped to the mill 594 tons of ore. Received 1,750 tons of crude bullion on the two weeks' run, and shipped to the company to-day $13,975.88. South drift No. 1 from south winze No. 2, 385-foot level, is in 116 ft; progress, 11 ft, showing the vein 11 ft wide. The north drift No. 3, from the main west crosscut, has been extended 12 ft; total length 206 ft. The vein here is 3 ft wide. South drift No. 4, from east crosscut No. 2, is in 167 ft; progress 11 ft, with the vein 2 ft. Upraise from south drift No. 1, 500-foot level has gained 10 ft; total length 115 ft; the vein is about 2 ft wide.

BULWER CON.—The south drift from west crosscut No. 2, 500-foot level, has been extended during the week 11 ft, and is in 307 ft. The vein is about 1½ ft wide.

BODIE TUNNEL.—Advance in the north drift on the 200-foot level 15 ft; total 135 ft from the west crosscut.

Nevada.

QUARTZ AND GRAVEL.—*Transcript*, June 28: The Yosemite mine, near Banner Hill, which is now being worked by Tiernan & Co., promises to be a good mine. They have taken out one crushing which yielded about $40 per ton. Some time ago they commenced running a tunnel to tap the ledge and expect to make the connection this week when the development of the mine will be pushed ahead. The Nevada drift mine, at You Bet, is now employing twice as many men as were required when the mine was worked by the hydraulic process. The quartz mines in and around Nevada City, were never in a more prosperous condition than at the present time. Never in the history of the town were there so many quartz mines in full operation and twice as as many claims are being prospected now as were ever before at one time. The outlook for this district is exceedingly brilliant, all croakers to the contrary notwithstanding. The prospects in the mine at Willow Valley, which is now owned by Geo. E. Turner, Ed. Tilly and Capt. Hieatt, are very fine. A large number of assays, of the rock, taken from different portions of the ledge, indicate it to be big property. The lowest assay was $13 and the highest about $140. Work is to be renewed on the Black Prince mine, Deer creek, some time this summer. it is situated on the east side of the Providence mine, and has not been worked for a number of years. The North Banner Quartz Mining Company, will, in a short time, give employment to a great many more men than they now do. The Hussey mine in Willow valley district, continues to look well. They are about letting some contracts for the running of drifts. Before long this mine will be in a condition to rank among the best hereabouts. The Locklin mill is kept running a great deal of the time on custom rock which is being taken out of newly discovered ledges in that locality. The Neversweat mine on Deer creek is in a very promising condition. The owners feel highly elated over the results thus far obtained from their property. More interest is now being taken by our merchants in quartz mining than ever before. The reports from the Derbec drift mine are of the most flattering character. A short time ago some of the stock was sold in San Francisco for 50 cents per share. Now it is held at double that price and very little is offered for sale at any price. The news in relation to Washington quartz mining district continues to be of the most favorable character, and we know of no reason why it should not be better and better as each additional day's prospecting is done. A better chance for making a good strike does not exist anywhere. If the mountains of quartz that are there had been located in the Coeur d'Alenes, with the thousands of live gold-hunters that recently congregated in the latter country large and permanent towns would have been built up; but Washington district being in Nevada county is too easy of access to be appreciated. It is generally believed that the North Bloomfield and Milton hydraulic mining companies will make an attempt to drift their ground. We hope they will as it would give employment to an army of men and an era of prosperity would dawn upon the now poverty-stricken people on the Ridge, who were made poor by the unrighteous decree of a man by the name of Sawyer. In the mean time every company which has not aided in the defense of the crusade against the miners should come forward, coin in hand, to assist in having Sawyer's decision reversed. The fight should never be given up until every hydraulic mine is put in successful operation again.

SPENCEVILLE COPPER.—Nevada *Transcript*, June 30: That the mill on the copper mine is about to be removed. Cause: The best of the ore has been ascertained to be right under the mill, and as the vein extends to the surface the mill has to be moved or the vein left unworked. The mill will be put up in a more substantial manner, as the owners of the mine are confident that they have a good thing, and they are going to stay by it. The hoisting works will not be removed. There are now 18 white men and 25 or 30 Chinamen employed at the mine, and when the mill is moved more men will be put on. The ore is improving as depth is attained, and, all in all, everything looks well for the prosperous future of the Spenceville copper mine.

Plumas.

LUCKY S.—Greenville *Bulletin*, June 21: Satisfactory arrangements have been made with Messrs. E. D. Hosselkus, John Hardgrave and J. W. Thompson, to furnish the needed funds to erect a mill on the property, and to place the mine in complete running order. Voluntary aid from the stockholders, therefore, will be unnecessary, and no assessments will he made. The gentlemen named above are among the "solid" men of the county, men of business capacity, and will prosecute with vigor whatever they undertake. Everything at the mine is looking favorable, and the work is progressing satisfactorily, considering the annoyance of the late rains. The Gold Stripe mill has stopped for the present. The rock that was crushed came from a break from the main ore chute. The mine is not sufficiently developed to keep the mill running. The Supt. informs us that from less than 170 tons crushed, $1,000 was obtained. It is a pity that the owners in New York do not put up sufficient money to properly develop the mine. The Providence mine owned by Adams & McPherson is looking quite well. We are informed that the reports from three assays made in San Francisco, shows an average of $19 per ton.

ELIZABETHTOWN.—Plumas *National*, June 28: The Loring & Leavitt shaft is down 104 ft, and a drift is being run to the east to tap the channel. The water is not troublesome as yet. The works are being inclosed and covered in good shape, and the owners expect in a short time to be taking out good pay. Everything goes like clock-work, and so far no back-sets have been encountered.

San Bernardino.

PROVIDENCE, EXCHEQUER, ETC.—Calico *Print*, June 28: From Mr. Sy. Quinn, we obtain the following reliable information as to what is doing in the mining circles in eastern portions of this county:

PROVIDENCE.—In the famous Bonanza King, a large and exceedingly rich body of ore has lately been found upon the 400-foot level, keeping the mill constantly running, turning out the usual quantity of silver oullion, working from 80 to 100 men. The northern extension of the Bonanza King, owned by P. R. Kerr, has a shaft down 50 ft, with a drift running northerly 40 ft and a winze at the end of drift 35 ft in depth showing high grade from the surface to the extreme depth, about 80 tons of ore on the dump. J. B. Cook's claim is now showing up well. Gorman and Dwyre are owners of a mine of great promise, having a short time since struck a good body of very high grade ore. The outlook of the camp in general is flattering, giving promise that Providence will, in the near future, come to the front as a bullion producer, and add one more star to the banner of old San Bernardino.

Sierra.

A GOOD FIELD FOR INVESTMENT.—Sierra *Tribune*, June 27: It is safe to say that capital and enterprise are all that is necessary to develop the fortunes now lying idle in the quartz lodes in Sierra county. Sierra has always stood high among the rich mining districts of the State, and it has been pretty clearly demonstrated that an investment of capital in the mines of this county is no wildcat speculation. It is slowly dawning upon people that the old mining counties of California are a mighty long ways from being "petered out" yet. And they are entirely correct in coming to that conclusion. We who live here know that the mineral resources of Sierra county have scarcely begun to be developed yet. The mining industry is yet in its infancy.

THE BLACK JACK MINE.—C. W. Cross was up from Nevada City Monday on business connected with the Black Jack quartz mine, located in Jim Crow canyon. J. B. Johnson of New York City is now the sole owner of this property. Mr. Cross is going to New York immediately to conclude arrangements preparatory to starting up the mine. He expects to begin operations there this summer, and funds have already been raised for that purpose. The mine will be under the control of Mr. Cross, who will place in charge an experienced miner.

THE FOUR HILLS MINE.—Geo. Reynolds, Jr., was down from the Four Hills mine last Wednesday and reports everything in good condition. The mill was started up little over a month ago, and is running on first-class ore. Twenty-five men are employed at the mine, and work is being pushed rapidly ahead. The snow in the vicinity of the Hills is about three ft deep.

ALLEGHANY.—We are informed that this place is rather quiet at present. The Rainbow Company are pushing ahead their new tunnel as rapidly as possible. When the vein is reached the mill will start up again and a large number of men given employment. There is no doubt of a successful result to the prospecting operations now going on in that district, and eventually this will restore life to the now comparatively dull town of Alleghany.

MINING INTERESTS.—*Mountain Messenger*, June 28: A large number of idle men are here, unnecessarily attracted by an over-flattering account of demand for labor. Miners abroad better heed this timely warning, and seek elsewhere for work. Blue Gravel Co. are sinking through gravel to bedrock, looking for pay. Five men are employed. Colombo Co. are making a road from their quartz mine back on the ridge to obtain timber and wood. This will do away with the chute, now being used. The 20-stamp mill is steadily running. Supt. W. H. Rodda, formerly of Grass Valley, has charge of the property. Rising Sun Drift Co., near Thompson's ranch, below Sierra City, have their main tunnel through the rim rock, and chances are very favorable for finding rich gravel. Last fall, a half-ounce gold specimen was discovered in the underground workings, besides smaller pieces. Phillip and Samuel Uren and Wm. Eldridge are the owners. Kentucky Quartz M. Co. are bringing in a large flume, four ft wide and three ft high, very near one-half a mile of which has been graded, mostly through hard blasting rock, to work the ledge. This mine is located back of the residence of Thos. Devine, and claimed as an extension of the Sierra Buttes, running east and west. Ike Martinetti and Jas. Kane own the property. Young America quartz ledge, between Sardine and Packer lakes, is now connected by trail with the Sardine house. Sinking of a shaft 5x6 has been commenced. Ore in sight is very rich, milling over $50 a ton. There are four locations each of fifteen hundred ft. Ledge is traceable all the way. A cabin, to accommodate 8 or 10 men, will soon be built, and a 10-stamp mill put up by fall, if everything prospers. Owing to the late storms, work has progressed slowly. Five men are employed.

Siskiyou.

PICK AND PAN.—Yreka *Union*, June 26: The Cedar Tree quartz mine on Deadwood will yet come to the front as one of the best leads in the county, under the energetic management of Messrs. Tucker, Knight and Behnke. Their arastra has been idle for several days, but will soon start. They can crush 2¼ tons a day easily enough, insuring good pay with the rock now being taken out. The Humming Bird quartz mine, on Deadwood, is looking up, and the force of workmen will be increased soon. The claim has excellent water privileges, sufficient to run a mill should they decide to erect one. At present the crushing is being done by an arastra, and a new one will be commenced before long. A new tunnel will also be commenced in a few days. Richer strikes are expected in the Deadwood county than in any other portion of the county, which is due to the fact that nearly all the ledges pay the expense of thorough prospecting. The Eliza, on Deadwood, is being worked, and the owners have the greatest assurance that their labor will be rewarded in time. All the claims on McAdams creek are paying well. The Mitchell claim at Callahan is being energetically worked this season, and will pay well, as it has in the past. The hoisting and puniping machinery in the mine is not excelled by any in the county. The McConnell claim, on the Klamath, is being worked with telling effect. One hundred dollars is taken out daily. The stockholders of the Empire lode, situated in the Honolulu district, are jubilant over the flattering developments now being made. We are at present enjoying a mining boom, and as the majority of our claims are operated by home capital the county receives the full benefit. We have the mines, and we have the capital to work them as they should be.

NEVADA.

Washoe District.

OPHIR.—*Enterprise*, June 28: Are sorting out fillings in the various drifts on the 250 level. Are preparing to start a drift from the 500 level of the main shaft, which will drain all the ground in the old works from the bottom of the old Mexican shaft upward and permit of a thorough exploration of the ground.

HALE AND NORCROSS.—Good returns have been obtained from the ore worked at the Mexican mill on the Carson river, and ore is now being shipped to the Eureka mill. To the latter some 600 tons have already been shipped. This ore is from the 200 level

MEXICAN.—They have now but fairly begun sinking the winze toward the 3300 level. About the only change seen is that there is rather more quartz in the bottom than was seen above.

SIERRA NEVADA.—The work of putting in column at the hydraulic pump in the joint Union Con. winze is completed. The diamond drill, which has been put into the north drift on the 3100 level, is showing quite a strong flow of water. However, this water may come from a small streak that will soon drain out,

ALTA.—Good headway is making in the east drift on the 2150 level. The ground thus far is perfectly dry. The diamond drill is again being run to the west, the miners having pushed the drift forward to the end of the old drill-hole. The drill is now out nearly 100 ft.

CHOLLAR.—Good progress is making in the construction of the stone bulkhead on the 2600 level. Now that the pump is in at the 2900 level of the Combination shaft they will soon be able to resume prospecting in this mine and the Potosi.

IMPERIAL.—The lateral drift from the main west drift is in the Alpha ground. It shows much quartz of a favorable appearance, and the indications are good for finding ore that will pay milling.

BEST AND BELCHER.—Good progress is being made in the joint Gould and Curry west drift on the 2500 level. Work is also in progress in the east drift on the Con. Virginia line on the 1200 level.

YELLOW JACKET.—Sufficient ore is being extracted to keep the mills on the Carson in constant operation. The exploring drifts are finding a considerable amount of ore that will pay for milling.

COMBINATION SHAFT.—The Cornish pump at the 2900 level has been started up and prospecting operations will no doubt soon be resumed in the middle mines.

BELCHER.—The usual amount of ore is being extracted and sent to the mills, and considerable work is being done in the way of prospecting.

ANDES.—Some paying ore continues to be found, and the exploring drifts show a good deal of quartz that looks well and promises to carry ore.

SCORPION.—Work is progressing as usual in the main west drift on the 500 level. The rock remains about the same as heretofore noted.

SAVAGE.—All is now in such shape that prospecting may be resumed whenever the officers below give the word.

CON. VIRGINIA.—The east drift on the 2900 level is being advanced at the rate of about 30 ft per week.

Belmont District.

BELMONT.—*Courier*, June 26: Since my last report have advanced 200 level nine ft in good ore, showing two ft ore in the face. Stopes are above level from 30 to 35 ft, all yielding good ore. Stone cooling floor 106 by 30 it is completed. Building over the same will be finished next week.

Columbus District.

MOUNT DIABLO.—*True Fissure*, June 28: The west drift from winze No. 5 has advanced 71 ft, and shows small spots of ore. The east drift from the same winze is giving a little ore. The east drift from the north crosscut, west of the shaft on the third level, is now in 30 ft, and shows a strong ledge of low grade, with a little ore of good grade. The west intermediate, between the second and third levels, is now in 84 ft, and shows 18 inches of $35 ore. The raise from the south crosscut, from the east drift on the second level, has connected with the winze from the east drift on the first level, and an intermediate has been started from the raise. The east drift from the north crosscut, west of the shaft on the second level is 107 ft long, and shows 8 inches of $75 ore. The west drift in the intermediate between the first and second levels, is in 61 ft, and shows six inches of $60 quartz. An east drift in the same intermediate is giving some $90 ore from small streaks. The incline is now 167 ft below the third level. The east drift from the incline, that is to connect with winze No. 3, is in 30 ft.

Comet District.

GOOD PROSPECTS.—Pioche *Record*, June 21: The prospects in this district are reported by all who have visited them as possessing merit. The claim owned by Clark and Willett continues looking well, and the owners are taking out good ore. The Latimer boys are also taking out good ore, and the claim owned by Freudenthal gives promise of proving a valuable claim. The ledge is said to be about from two to three feet in width, and contains a streak of about eight inches that assays $140 to $450. The whole ledge, it is thought, will average about $80. The Burrows claim is also looking well.

Esmeralda District

WORK ON THE ESMERALDA BEGUN.—Walker Lake *Bulletin*, June 27: Last week Judge Seawell and John Neidy put a number of men at work on the Esmeralda. They are now taking out ore and have contracted with Governor Blasdel for the Humboldt mill for crushing. A large quantity of milling ore is in sight, which will pay well at the present cost of milling.

Grantsville District

INDIANAPOLIS.—*Bonanza*, June 28: Work was commenced on the Indianapolis mine last Monday under the superintendence of Ed. Cain. This is a move in the right direction. A silver mine cannot be made a bullion producer without the expenditure of money and muscle. From the past history of the Indianapolis there is every reason to believe that it will develop into a paying mine as work progresses. There are several mines around Ione equally as good as the Indianapolis languishing for lack of capital to develop them.

Reveille District.

LEADING.—Cor. Belmont *Courier*, June 28: Since my arrival in this place I have been running the leaching works for George E. Clarke and Joe Bianchi successfully. We have been out of hyposulphate of soda and for the last week have been idle. The team of John E. Norris is expected in at any moment from Eureka with a supply. Owing to the mismanagement of our mining interest and the withdrawal of capital therefrom, especially in Nye County, it behooves an old miner and prospector to say a few words on a subject connected with the interest of all.

We know that there are mines lying idle in Nye County that could be made immense bullion producers, and tend to the growth and prosperity of the County Seat and surrounding towns and ranches. An examination of ore bodies should be made by our merchants and business men, and, after correct assays are made thereof, sufficient assistance should be extended to the prospector or miner developing the same. By such a course, it seems to me, we can redeem the former prosperity of Nye County.

Secret Cayon District.

GEDDES AND BERTRAND.—Cor. Eureka *Sentinel*, June 27: West Bigbee, from New Mexico, who came here to examine the Geddes & Bertrand mine, went out to Secret Canyon Monday. Mr. Bigbee was greatly surprised, and agreeably so, to find such an extensive plant and a mine of such prospects. The mine has yielded to the company about $600,000 from the surface to a depth not exceeding 300 ft. Mr. Bigbee is pronounced in his opinion that the property is worth continued prospecting a 1,000 ft. for the reason that no such surface developments could be made independent of a great mine below. He thinks that with deeper prospecting large chambers of ore will be found to yield an ample supply for keeping the mill at work. He was surprised to hear that the company had not encouraged the working of more

custom ores, which he thought, would have aided greatly towards keeping the mill going. Judging from the extensive showing of profitable mineral country in the neighborhood of Secret and Eureka districts, generally, he does not think the leaching works are all too large. His attention being called to the great works at the Richmond, he said he thought its plan of receiving custom ore a good business for the company and for the camp, and he believed the Geddes & Bertrand could do a similar business in leaching. After inspecting the Geddes & Bertrand mine and mill our party went to look at Mr. Mitchell's mining property, which is about a mile south from the canyon. This property is marked by immense croppings and shows indications for extensive mines.

Taylor District.

MEX.—Pioche *Record*, June 21: There are some 20 men employed at Taylor, and prosperity seems to shed its golden rays on that camp.

Tuscarora District.

NORTH BELLE ISLE.—*Times-Review*, June 28: No. 2 crosscut, 350 foot level, has been extended a total distance of 100 ft, and 70-foot level drift north, has been advanced 10 ft. No material change in the above workings.

BELLE ISLE.—East crosscut, 450-foot level, has been extended 61½ ft; total distance, 144 ft. Work has been commenced on the joint Belle Isle and Navajo upraise on the "east" vein, 250 foot level.

INDEPENDENCE.—No. 3 upraise, 300-foot level, has been connected with the 175-foot level. The upraise has yielded the usual grade of ore during the past week. The 400-foot level drift west has been extended 18 ft. Will start a drift east this week on the same vein.

GRAND PRIZE.—The south drift on the 200-foot level has been advanced 26 ft, and south drift on the 300 level 31 ft. A raise has been started above the 400-foot level to connect with the 300, which is up 22 ft. Have commenced repairing the mill.

NAVAJO.—South drift from No. 1 crosscut, east vein, 250 foot level, has been advanced 9 ft; total length 109 ft. The face of the drift shows no material difference in the quantity or quality of ore from that of its entire length. North drift from same has been driven to the Belle Isle line, and work will now be commenced on a joint upraise on the vein to the 150-foot level. No. 1 upraise has been carried up 39 feet. The vein shows the usual width of high-grade ore. Winze from No. 1 crosscut, east vein, 150-foot level, has been sunk 10 feet; total depth 31 ft. Work in the chambers on the "west" vein continues to develop a large amount of low grade ores.

ARIZONA.

THE INDEPENDENCE STRIKE.—Tombstone *Epitaph*, June 26: The strike in the Independence mine, on Aunt Sally hill, is daily growing into greater proportions. Gus. Baron and J. H. Striedinger, who bought the Fields interest at administrator's sale recently for $500, would not dispose of that interest for ten times the amount. The strike is the most important made in this camp for twelve months, showing as it does a large body of high-grade ore in a place where nothing of consequence had hetetofore been produced. Mr. Baron, who was formerly foreman of the Toughnut, thinks he has the West Side ledge, while others think it a cross-ledge connecting the West Side and Contention lodes. No matter what it may be, it is a magnificent showing.

FROM THE MINES.—Cor. Prescott *Courier*, June 27: The Lane mine is in bonanza. Mine and mill are running. Dan Thorne, who knows the Silver Belt mine "like a book," says the general supposition that the ledge is small is false. The richest pay streak is not immense in size, but the ledge, proper, is very large. Our friend, W. R. Morgan, has, by request, contributed the following encouraging news about the Pine Spring and other mines in Turkey Creek district: We commenced work on the mine on the fifth of this month and have 400 sacks ready for shipping and will ship between now and the first of July. We took out a small nugget yesterday that weighs about one hundred pounds, solid metal. The Yankee Boy is looking fine; they are about ready to make their first shipment. The Wheel of Fortune, owned by W. R. Morgan, Tom McDonald and Lewis Armstrong, is showing up splendidly. Work was commenced on the property a few days ago. The Longfellow, owned by McCann & Co., is looking well; there are several fine prospects in the Longfellow district, the Hawkeye Sulphuret, Walla Walla, Longfellow No. 2, and others that I cannot think of their names. There has been a new strike between the Pine Spring and the Yankee Boy of good ore. The find was made by a prospector by the name of Alexander Dering. The Syndicate, north of the Pine Spring, is looking well as work progresses, and the boys are going for it as fast as they can.

THE KIMBALL.—Arizona *Miner*, June 28: The machine and machinery of the Kimball mill have been put in place on Lynx creek, and the mill will be put in operation on Monday next. Mr. G. W. Curtis has already some 300 tons of excellent gold rock with which to commence operations and the prospect is very flattering for a speedy run of most excellent bullion The mill hands will awaken the neighbors Saturday evening by their whistle. Some twenty men will be employed in and around the Kimball.

COLORADO.

PUEBLO'S NEW SMELTER.—Pueblo *Star*, June 23: In our round to-day we wandered over to the new smelter building, where we found Messrs. Clink, La Force and Vincent, the contractors, pushing things rapidly towards completion. The stone foundation is all done, with the exception of a small break, which was caused by the heavy rains recently. The brick walls, which are to be 20 ft high when completed, are now erected 15 ft. The rooms which are to contain the machinery are nicely arranged. The smoke flues are so arranged as to drive the smoke to rear end of the building when it winds around over a partition wall which contains a metal plate to catch the particles of mineral which would otherwise be carried off with the smoke. They will erect three furnaces to commence operations with, of a capacity of 60 tons each. The stack is one of the finest ever built in the State. It is built octagon shape and will be 150 ft high when completed, it being 120 ft at the present writing. The foundation of this stack is of stone 22 ft square, with a brick base of 16 ft square and four ft thick. The contractors think they will complete the entire brick and stone work in about three weeks. Mr. Mark Hodgson, formerly of Michigan, but late of Alma, is the general manager of the concern, and is well pleased with the outlook for the new plant. Mr. L. W. Morgan, of Swansea, Wales, is Supt. Mr. Morgan is a graduate in metallurgy and is said to be one of the most practical smelter men in the State. The track has been completed from the Steel Works to the smelter and the laying of water pipes commenced several days ago.

EXCHEQUER DISTRICT.—Is situated some twenty-five miles easterly from Providence, is a new camp of much promise, the ores rich and ledges well defined. The Cashier, owned by some of the citizens of this place, under the management of Levi Blackburn, is down about 50 ft, with a considerable quantity of ore on the dump that the owners are confident will work 100 ounces per ton. They also have a small lot that assays 400 ounces per ton in silver. Everything looks encouraging. Six to eight men at work.

IVANPAH.—Ally is working quite a force of men taking out high grade ore, for which the old camp is so famous. The mill will commence crushing as soon as Mr. Bidwell returns from San Francisco. The McFarlane Bros.—Billy and Tom—are working a rich mine some twelve miles eastward from Ivanpah. They have considerable high grade ore ready for shipment in a short time. Tom McFarlane passed through Daggett last Saturday enroute for the mine and Pahrump.

LEADVILLE'S ORE PRODUCTION.—*Herald*, June 28: The daily ore production of Leadville, excluding iron ore, is much larger than is generally estimated by most persons, and 50 per cent greater than reported by our contemporary. The daily output aggregates at least 970 tons as follows: Iron Hill and California Gulch mines, 300 tons; Printer Boy and Rock Hill mines, 100 tons; Carbonate Hill mines, 200 tons; Fryer Hill mines, 115 tons; Yankee Hill mines, 85 tons; Little Ellen Hill mines, 100 tons; Sugar Loaf, Big Evans Gulch and other sections, 70. Total, 970. With the advancement of the summer season this output will increase, and it is reasonable to presume that during July the output of the Leadville mines will average at least 1,110 tons per day, which, compared with last year's production for the same month, will show a slight increase. With the exception of Iron Hill, which shows a marked falling off, all other sections are doing very well. By the suspension of the Silver Cord mine and the decreased productions of the Iron Silver properties, a loss of at least 10,000 tons a month is sustained—a very considerable amount to be regained by the other sections of the Leadville district. The hills that show a notable gain in their production this year, compared with last, are Yankee, Printer Boy and Rock. The difficulty with the smelters is not so much in the lack of ore as in the absence of ores running high in lead, without which dry ores cannot be smelted. The smelters at present are paying good prices for ore running in lead, and in a short time the objection to mining lead ore on account of the low price of lead will be obviated, and the majority of our smelters will again have all their furnaces in blast. At the present time, out of the 24 furnaces in the city, 16, or two-thirds, are doing service, while a fortnight ago only one-half of the total number were in blast. We believe it is safe to estimate that by the middle of July four-fifths of the furnaces in the camp will be in operation, and while the amount of base bullion produced daily will not be as great as it was at this time last year, the value of the bullion will be higher, and the value of the bullion production in excess of that of the same period of 1883.

IDAHO.

BIG YIELD.—Wood River *Times*, June 26: The Vienna mill has now been working for nearly a year, and to-day two bars of its bullion were received at the express office here. These bars were number 149 and 150, respectively. As they are worth $1,500 on an average, this indicates a yield of about $250,000 for the year. As the mill was entirely new and the ore rather difficult to work, this is a very good record, but one that will doubtless be surpassed this year, now that the nature of the ore is better understood.

ABOUT TO CHANGE HANDS.—There is some likelihood of the Idaho Democrat mine, above Smith's Springs, changing hands soon. The sum of $1,000 has already been paid as an earnest of intention, and an additional payment is due soon, which is expected to be made. If it is, the new owners will take possession at once, put on a strong working force and begin shipping ore.

ANOTHER STRIKE.—Judge Lawrence came in Saturday, evening, to inform his pardners of the new strike he recently made in the Cyclops claim, situated on the Bullion divide, half-way between the Narrow Gauge group and the Wolftone mine. It consists of 18 inches of steel galena, which is evidently high grade. The new strike was made about 400 ft away from where the Porter Brothers made their strike a short time ago, and on the same ledge. It is therefore probable that the ore body is continuous from the Red Cloud—which is the name of the Porter Brothers, claim—to the Cyclops. The Red Cloud ore carries an average of 125 ounces silver and 65 per cent lead.

AT VIENNA.—For a couple of weeks past little or no bullion has been shipped from Vienna. This is due to the influx water in the Vienna mine, which, with the Mountain King, is the only mine up there in shape to yield ore in large quantites at present. The Vienna ore works freely, but the King ore is exceedingly base, and quite low grade. It requires to be roasted, and as the furnace cannot keep the stamps supplied with roasted ore, over half of the crushing capacity of the mill is idle. About 100 men are employed by the Vienna and Mountain King at present but by the Fourth of July this force will be increased to about 150. In addition about 100 men will be employed most of the summer in chopping wood and timber for lagging, and probably 50 men will be employed on the Solace, Lion, Nellie and other mines near the town—so that it is safe to say that during most of the present season, about 350 men will find employment in and around Vienna. This need not encourage any one to go up there in search of employment, however, as there are dozens of idle men there already.

DREAM GULCH.—Cœur D'Alene *Eagle*, June 26: Dream gulch still maintains its position as the banner gulch of the camp. The cleanup of last Sunday was something astonishing, being up into the pounds. The actual weight of the cleanup for a 72 hour run was 18½ pounds, 3 pwt. and 7 grains. A nugget was found in the cleanup that weighed 19 ozs., 11 pwt. and 3 grains. It measured 3¼ inches long and 2½ inches wide at the widest part and about half an inch in thickness, irregular in shape and slightly impregnated with quartz. They made another cleanup Tuesday evening of 280 ounces after a forty-eight hour run. The Alder gulch people threaten to shut off the water from Dream gulch as they need it all themselves, and the Dream Gulchers are running a preliminary survey for a new ditch to tap Pritchard creek near Butte city.

THE MOTHER LODE.—We made a visit last Wednesday to this famous ledge, and found the proprietors busy at work putting in new timbers preparatory to driving the tunnel ahead to develop the ledge. The water is down to a stage, which exposes the ledge matter four ft lower than it has ever been visible before; and all the way down, the same wonderful exhibit of massive chunks of gold embedded in the quartz, is exposed. It is a truly wonderful sight and is the astonishment of all beholders.

GOLD RUN.—Gold Run is the first gulch above Murray and promises to be equal to any of the gulches, when a little more development work has been done. All the claims along the gulch are being represented by solid work, notably claim No. 4, owned by Messrs. Brown, Beers, Jennings and Rupert, who purchased the claim about three weeks ago. They have already got a string of sluices running and have so far taken out enough to pay expenses and leave a surplus. They have not yet struck bedrock. They intend to put on a hydraulic as soon as the contemplated ditch along the ridge is completed.

WM. DEMPSEY PLACER.—*Eagle*, June 26: This placer adjoins the Maggie D. A large drain ditch has been cut and a shaft 10x12 and about 13 ft deep has been sunk. The lumber has all been whipped out for sluice boxes. Mr. Dempsey has now on the way a large steam pump which he intends putting in the shaft and finding bedrock if it is anywhere this side of Gehenna. The development of this claim will be watched with eager interest by the claimholders along the creek, as it will demonstrate beyond a doubt, the feasibility of steam over the primitive method now in vouge, and if anything like the anticipated results are obtained, steam pumps and hoisting works will cease to be a novelty along Pritchard and Eagle creeks.

AURORA PLACER.—The Aurora is situated on the hill trail to Murray, and is owned by Messrs. Hitch, Ball, McKenzie and Coy. They have a drain ditch 400 ft long, averaging 14 ft deep, and a shaft 16 ft deep. They will have a 16 foot water wheel and a China pump to work on the shaft in a day or two and intend to stay by it till bedrock is reached or the bottom drops out.

LOW'S FRACTION.—This claim is a fraction adjoining the Aurora and is owned by Messrs. Smith, Alexander, Vaughn, Workman, and the Williams Bros. Development work has not been commenced in good earnest yet, though the boys have not been idle by any means. Over $2,000 have been expended in constructing dams and turning water preparatory to active development.

THE FRANK GROVE.—The Frank Grove placer is owned by Messrs. Grove, Likely and the Hay Bros. and adjoins the Jupiter. A drain ditch has been dug the length of the claim to turn Pritchard creek and averages ten ft in width and five ft in depth. They intend to work in the old channel of Pritchard, but the high water has compelled them to suspend operations for the present.

THE GELLET.—The Gellet adjoins the Frank Grove. They have the sluice boxes set and a drain ditch 100 ft on the upper end of the claim, and before our next issue, will be able to show up dust. On the lower end of the claim, a drain ditch between six and seven hundred ft long with a face of 12 ft has been dug.

THE WYANDOTT & PETERS.—This claim adjoins the Geilet and is owned by Stewart & Co. They are working 13 men and have constructed a drain ditch 1,000 ft long by 18 ft deep and have blasted seven ft into the bedrock. They are now timbering the ditch and intend letting Pritchard creek run through before the week is over.

THE LAST CHANCE.—The Last Chance is owned by Capt. Wooten & Co. and is situated on the creek opposite the Wyandott. They will be running three strings of sluices the first part of the coming week. They are working eight men at present and have about 400 ft of drain ditch.

MEXICO.

NEW PLACER MINES IN SONORA.—A letter from the town of Caborca, Sonora, dated June 20th, says: Within the past five days, near the "Polomas" (Feather), a very rich section of placer ground has been discovered that is attracting considerable attention, and merchants are abandoning their business and, with the inhabitants, are flocking to the new placers, leaving the town almost deserted. There are fabulous stories told of the richness of the placers, and everyone who returns from there brings more or less gold, increasing the excitement. Nearly all of our merchants have left with cargoes of provisions and merchandise.

MONTANA.

MAGINNIS MINING CO.—Maiden *Argus*, June 26: On June 3d the company incorporated under the laws of Montana, the incorporators being S. T. Hauser, A. M. Holter, Geo. H. Hill, A. K. Barbour and A. M. Esler. The capital stock is fixed at $500,000, divided into 100,000 shares at $5 each. The company decided to commence all proposed improvements at once, and have the new mill running by August 31st. Fully $20,000 will be expended in the next few weeks in machinery, buildings, etc. The machinery decided upon will consist of a double oscillating Huntington mill with a capacity of from fifteen to twenty tons per day, being equal to a 10-stamp (drop stamp) mill; concentrators and amalgamators, and a 50-horse-power engine of Cincinnati manufacture. The concentrating and amalgamating machinery is being manufactured by the well-known house of Fraser & Chalmers, of Chicago. The main building, the grading for which was inaugurated this week, will be 40x80 ft, 2½ stories high, constructed to accommodate more and varied machinery should it be needed, at a future date. Tom Fisher, of Helena, has been engaged to take charge of the construction of the mill. It is the intention of this company to treat custom ore as soon after starting up as arrangements can be made. Mr. Esler estimates that the company will employ, as mill men and miners, between forty and fifty hands, in addition to a number of wood choppers. It is expected the new building will begin to go up the latter part of next week. With the prosecution of work by this company and the early advent of the smelter of the Maiden Reduction Co., our camp will certainly enjoy a degree of prosperity that will give it a decided boom.

NEW MEXICO

LAKE VALLEY RICHES.—La Vegas *Gazette*, June 28: One year ago there was a wail over the failure of ore in the Lake Valley mines. It was said by those who were supposed to know that there were only a few surface pockets, the greatest of which was the celebrated "Bridal Chamber;" and that, they being exhausted, the property was worthless. A former manager of these properties stated that there was nothing in them. Other men thought differently; they believed the mines had been badly worked and that while millions of ore were being taken out, no prospect work was being done at all. With a new regime, honest prospecting began and at once there was opened up several good bodies of ore, which have steadily improved. At that time the Sierra Bella company was $100,000 in debt and there was only a small output. To-day it is out of debt, a dividend of 15 cents per share has been paid, expensive machinery has been placed and there is a good working surplus in the treasury. The Sierra Grande Co. has every reason to feel jubilant over the recent opening up of new and enormous ore bodies. At one point their is in sight 30 ft of ore that averages over $30 to the ton and four ft of $100 ore that contains numerous rich pockets of very high grade chlorides. In the first 12 days of June $68,000 was taken out and the output will probably continue in the same proportion during the summer. One dividend is in hand and another in sight. The best improved machinery is in use in all the workings. With steam hoist and rock drills it is not extravagant to say that silver is pouring out of the mines. The track of the A. T. & S. F. branch has been built up to the very dump on the Bella ground, thus affording shipment at the minimum expense. It is now possible to ship ore which has previously been kept at home. The mill is now being improved and repaired, and with the recent edition of eight Frue Vanners for concentrating, there is not a better plant anywhere in the west. Dr. Taylor is in charge and his ability is well known. The credit for having brought the Sierra mines to their present excellent condition is due to Dr. F. M. Endlich, the manager, and to Daniel Ferguson, the Supt. Both are thorough miners and have succeeded in the places of other men who have failed. With the astonishing improvement in these properties has come a stronger confidence in mining throughout this section. There are few good properties that lie unworked, and the the output from New Mexico for the present year will be twice as large as it was last.

NOTES.—*Inter-Mountain*, June 28: The Posei is now being worked by a full force and is producing a better grade of ore than at any previous time. It is being treated at the Silver Bow mill. The main shaft of the Colusa is now 30 ft below the 400 foot station and will be sunk to a depth of 600 ft with all possible expedition. Operations in the Moulton are confined to the stopes and faces in the west drifts from the 200, 300 and 400 stations. In the 500 foot drift the ore is somewhat low grade, the main shoot not having yet been encountered in driving westward. The south vein of the Alice continues to produce the bulk of the output from that mine. Very little is being done on the north or main vein, nearly all the ore having been worked out as far as explored. The east and west drifts on the north and south veins of the Mountain View are being actively forwarded and the ore dump is rapidly assuming mammoth proportions.

UTAH.

REVIEW.—Salt Lake *Tribune*, June 27: The receipts of bullion and ore in Salt Lake City for the week ending June 25th, inclusive, were $121,738.90, of which $116,888.96 was bullion, and $4,850 ore. The receipts of the week previous were $140,152.68 in bullion and $5,000 in ore. The output of the Horn Silver for the week was 19 cars of bullion, $57,000, bringing the receipts of the year up to $1,097,000. The shipments of the Ontario, for the current week amounted to fifty bars, of the value of $37,680.63. One car of ore was shipped during the week. Total product of the Ontario this year, to date $760,529.67. The usual dividend of fifty cents a share, amounting to $75,000 has been declared the present month, payable in San Francisco or New York. The dividends of this mine now amount to $5,600,000. The Crescent works on tramway and sampling works are to be pushed with vigor, and the present season will put the company in condition, to defy the weather in its handling of ores. Two cars of ore were received from the Crescent during the week, valued at $4,850. A contract has been let to Mr. William Conner to drive a tunnel 250 feet on the Crystal mine, in the Big Cottonwood district. This property is owned by Salt Lake parties. Mr. Conner will start work on his contract as soon as he can get over in that part of the country with supplies. The Stormont sent up two bars of silver $3,420. The product of the Hanauer smelter for the week amounted to six cars of bullion, $14,295.

PARK NOTES.—*Record*, June 28: The Crystal property, spoken of in our last issue, was sold to Salt Lake parties by Mr. Wm. Conner. The Sampson company began sinking again on their shaft to-day. The pumps have the water under control, and they expect to be able to keep at work on the shaft in the future. Work has been started on the Dundee mining claim by Terry Brogan with a force of five men. He intends pushing work right along this summer. This claim is situated south of the Sampson. The contract for supplying ties for the new tramway, and for lagging for the Crescent, has been left to H. O. Young. Mr. Young has set quite a force of men at work, and will begin filling the contract immediately.

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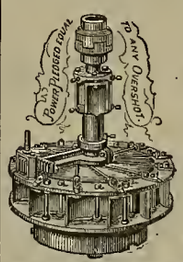

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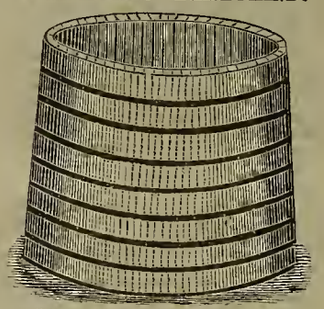

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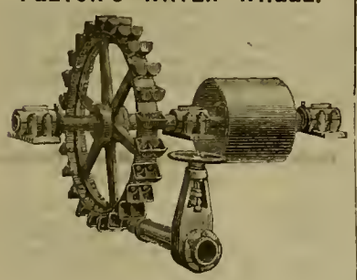

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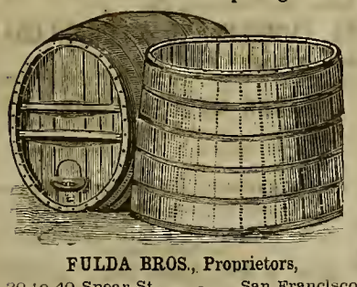

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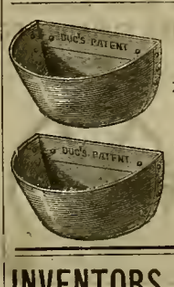

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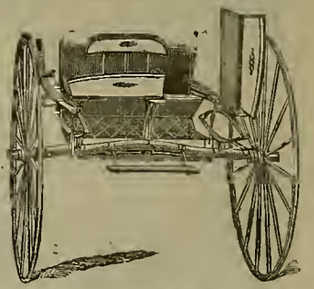

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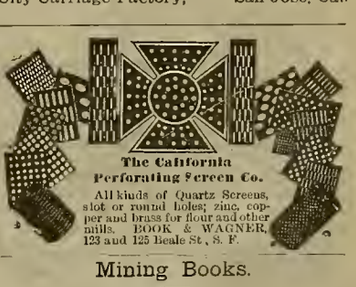
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Size of Shafts.

The average size of shafts now being opened in the anthracite regions of Pennsylvania is considerably larger than in former years. This change has resulted from several causes. Greater depth of shafts is required to open undeveloped coal in the deeper portion of the main basins, which necessitates larger cross section to secure better ventilation for these more gaseous mines. The policy now adopted of opening one large colliery in preference to two small mines necessitates better hoisting facilities.

The width of shafts is usually governed by the length of the mine cars, which ranges from 9 to 10½ feet; hence the width usually adopted is 10, 11 and 12 feet. The length is governed by the number of compartments and by the area of air-way needed. The compartments are now made from 6 to 8 feet broad inside the buntons, on average of about 6½ feet between the guides; hence the compartment, measured between the centers of the buntons, is usually from 7 to 9 feet. The length, therefore, varies from 16 to 20 feet for a shaft with two compartments, 30 to 38 feet for a shaft with four compartments (22 to 36 feet being the ordinary length for three compartments), and 44 to 52 feet for a shaft with six compartments. When this large number of compartments is provided, two are usually used for an up-cast air-way, and for the pump rods and column pipe, and in some cases one is used with hoisting compartments as a down-cast, while at other shafts two extra hoisting compartments are held in reserve for future requirements. The shafts in the anthracite region are rarely more than 800 feet deep, and their average depth is probably between 300 and 400 feet. Some very large shafts are made. One is 13x52 another 53x10, and still another 12x47.

When the opening is on ground covered with a moderate depth of soil, a rectangular pit is sunk to bedrock, from 4 to 8 feet wider than the proposed shaft, and this is then solidly timbered up or built up with stone curbing.

Mining Share Market.

There is very little doing in stocks this week, and the two holidays at the end of it make stocks matters still more dull. The Mexican deep winze is now fairly under headway for the 3300 level. The winze was timbered close down to the bottom at the time when it was first opened and before it was decided to push on down to the 3300 level, therefore in resuming work it was necessary to be very careful in blasting in order not to knock the timbers to pieces.

The diamond drill is being run in the north drift on the 3100 level of the Sierra Nevada, and has tapped quite a strong flow of water. Heretofore the ground in that direction has been quite dry. The present flow is probably from a small pocket of water that will soon run out.

At the Ophir they will soon start a drift from the main shaft at the 500 level, which will pass in under the bottom of the old Mexican shaft and drain all the old upper levels.

A good deal of prospecting is being done on the 1200 and 2500 levels of the Best and Belcher and Gould and Curry mines.

The Cornish pump having been put in place at the 2900 level of the Combination shaft, prospecting will now become active in the middle mines. They will probably resume work on the 2800 level of the Hale and Norcross in the first week in the next month. Ore from the 200 level is now being shipped to the Eureka mill, Carson river for reduction.

The several leading mines of Gold Hill are shipping about the usual amount of ore to the mills on the river.

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Our subscribers can do us an essential favor by sending their subscriptions to this office without delay. Please do not wait to be called on. We have actual need of all subscriptions due or over due. Prompt payment in advance alone will enable us to continue the publication of a first rate paper.

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ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELIN'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M Co	California	5	1.50	June 23	July 28	Aug. 14	A. Judson	320 Sansome st
Belmont M Co	Nevada	37	15	May 26	June 30	July 28	J W Pew	310 Pine st
Bodie Tunnel M Co	California	9	20	June 30	Aug 2	Aug 20	C C Harvey	309 California st
Bullion M Co	Nevada	29	25	May 19	June 20	July 10	J M Brazell	328 Montgomery st
Butte Creek Hyd. M Co	California	9	10	May 13	July 10	July 30	B L Taylor	230 Montgomery st
California M Co	Nevada	12	20	May 20	June 27	July 24	C P Gordon	309 Montgomery st
Cneva Santa M Co	Mexico	2	10	May 19	June 24	July 15	W Letts Oliver	328 Montgomery st
Columbus Con M Co	Nevada	3	25	June 2	July 7	July 28	J M Buffington	309 California st
Champion M Co	California	15	10	June 13	July 17	Aug 6	T Wetzel	322 Montgomery st
Eintracht Gravel M Co	California	15	05	May 13	June 28	July 17	H Kunz	209 Sansome st
Excelsior Water Co	California	6	50	Jan 29	July 1	July 29	H B Wheaton	215 Sansome st
Golden Channel Drift M Co	California	1	03	May 22	June 23	July 23	A B Paul	328 Montgomery st
Grand Prize M Co	Nevada	16	25	May 16	June 20	July 16	E M Hall	327 Pine st
Gould & Curry S M Co	Nevada	48	50	June 6	July 11	Aug 4	A K Durbrow	309 Montgomery st
Loreto M and M Co	Mexico	7	50	May 21	June 23	July 9	H G Jones	327 Pine st
Mammoth Bar G M Co	California	6	15	June 9	July 11	Aug 1	J W Pew	310 Pine st
Mayflower M Co	California	24	10	May 9	June 12	July 7	J J Morizio	328 Montgomery st
McElroy Gravel M Co	California	11	10	May 7	June 10	July 10	E W Levy	604 Merchant st
Mexican G M Co	Nevada	27	75	June 11	July 16	Aug 6	C E Elliott	309 Montgomery st
Mono Lake H M Co	California	1	50	May 19	July 2	July 21	J C Winans	331 Montgomery st
Morgan M Co	California	1	1.00	June 7	July 11	July 30	C S Neal	309 Montgomery st
North Pearl M Co	Arizona	1	2.00	June 12	July 17	Aug. 11	H Dean	309 Montgomery st
Pear M Co	Arizona	1	25	June 6	July 15	Aug 5	A Waterman	309 Montgomery st
Potosi M Co	Nevada	15	25	May 29	July 1	July 22	C L McCoy	309 Montgomery st
Real Del Castillo M Co	Mexico	2	20	June 28	Aug 4	Aug 22	A Judson	320 Sansome st
Rainbow M Co	California	11	15	June 16	July 21	Aug 18	P F Mohrhardt	311 Montgomery st
Starlight M Co	California	1	06	June 14	July 18	Aug 6	W Battles	513 Market st
Silver Hill M Co	Nevada	20	05	June 2	July 3	July 29	W E Dean	309 Montgomery st
Sierra Nevada M Co	Nevada	79	1.60	May 10	June 12	July 2	E L Parker	309 Montgomery st
Segregated Belcher M Co	Nevada	22	1.00	May 9	June 11	July 1	G D Edwards	414 California st
Union Con M Co	Nevada	27	50	June 9	July 14	July 31	J M Buffington	309 California st
Utah S M Co	Nevada	49	50	June 19	July 25	Aug. 13	C Pratt	309 Montgomery st
Valapara M Co	Mexico	2	20	June 28	Aug 4	Aug 22	A Judson	320 Sansome st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Best & Belcher M Co	Nevada	W Willis	309 Montgomery st	Annual	July 14
Belmont M Co	Nevada	J W Pew	310 Pine st	Annual	July 11
Cons Reforma M Co	Mexico	J E Hill		Annual	July 7
El Dorado South Cons. M Co	Nevada	D M Kent	330 Pine st	Annual	July 7
Homestake M Co	Dakota	I C Stump	309 Montgomery st	Annual	July 5
Savage M Co	Nevada	E B Holmes	509 Montgomery st	Annual	July 17
Utah M Co	Nevada	G C Pratt	309 Montgomery st	Annual	July 8

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	May 15
Bodie Con M Co	California	G W Sessions	309 Montgomery st	50	June 5
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	May 27
Idaho M Co	California			4.00	Apr 2
Jackson M Co	California	D C Bates	309 Montgomery st	10	Mar 16
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	June 19
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Apr 28
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Mar 15
Syndicate M Co	California	J Stadfeldt	419 California st.	10	Apr 2

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING June 12.		WEEK ENDING June 19.		WEEK ENDING June 26.		WEEK ENDING July 3.	
Alpha	....	....	.60	.65	.60	.70	....	.80
Alta	1.50	1.95	1.60	1.75	1.70	2.20	1.90	2.10
Andes	.25	.30	....	.25	....	.20	.30	.35
Argenta	....	....	....	....	....	....	....	....
Belcher	....	....	.70	.85	.70	.80	....	.70
Belding	....	....	....	....	....	....	....	....
Best & Belcher	1.60	1.90	1.00	1.60	1.15	1.70	1.50	2.10
Bullion	.10	.20	.15	.25	.20	.45	.35	.10
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	....	.35	....	.60	.60	.80	.60	.70
Bodie Con	3.40	4.30	3.70	4.30	3.35	4.45	3.20	3.65
Benton	.35	.50	.45	.50	.50	.60	.50	.55
Bodie Tunnel	....	....	....	....	....	....	....	.20
Bulwer	.60	.70	....	....	.60	.65	....	.50
California	.10	.15	.05	.10	.05	.25	.20	.25
Challenge	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Chollar	1.30	1.40	1.40	1.50	1.50	1.65	1.00	2.15
Confidence	.85	.90	....	....	....	....	....	....
Con. Imperial	....	....	....	.10	....	....	....	....
Con. Virginia	.15	.20	.10	.20	.10	.20	.15	.30
Con. Pacific	....	.30	....	.35	....	.30	.40	.50
Crown Point	1.05	1.15	1.10	1.25	1.10	1.23	....	1.15
Day	....	1.25	....	....	....	....	1.25	....
Eureka Con	....	3.00	....	....	2.00	2.10	....	....
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	.25	.30	.20	.30	.20	.35	....	.25
Grand Prize	....	.10	....	.10	.30	.35	....	....
Gould & Curry	.80	1.15	.35	.85	.50	.70	.55	1.00
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	1.50	2.45	2.25	2.60	2.45	2.80	2.65	2.90
Holmes	....	....	....	....	....	....	....	....
Independence	.25	.30	....	.25	.35	.40	....	....
Julia	....	....	....	....	....	....	....	....
Justice	.20	.25	....	.20	....	.25	....	....
Martin White	....	....	....	....	....	....	....	....
Mono	....	.75	.75	.85	.75	1.10	.45	.60
Mexican	1.00	1.55	.50	1.00	.55	1.05	.80	.90
Mt. Diablo	....	....	....	2.10	....	....	....	....
Northern Belle	....	....	....	....	....	....	....	....
Navajo	3.00	3.15	3.15	3.45	3.40	4.30	3.80	3.90
North Belle Isle	.15	.20	....	.20	....	.20	....	.20
Occidental	....	1.00	.90	1.00	....	....	....	.90
Ophir	1.00	1.10	.60	1.05	.70	.95	.80	.85
Overman	....	.20	....	.15	....	....	....	.15
Potosi	.35	.40	.40	.45	.40	.45	.40	.80
Pinal Con	....	....	....	....	....	....	....	....
Savage	.65	.70	.60	.75	.70	.75	.70	.80
Seg. Belcher	.35	1.40	....	....	....	....	....	1.25
Sierra Nevada	.50	1.50	1.00	1.55	1.00	1.10	1.00	1.10
Silver Hill	....	....	....	....	....	....	....	....
Silver King	....	....	....	....	....	....	....	5.25
Scorpion	.25	.30	.10	.15	....	.10	....	.10
Syndicate	.46	.65	.45	.50	.50	.60	....	.50
Tioga	....	.05	....	....	....	....	....	....
Union Con	.85	1.40	.60	1.00	.60	.80	.65	.75
Utah	.55	.75	.35	.50	.40	.45	....	.30
Yellow Jacket	1.60	1.80	1.60	1.90	1.75	1.80	....	1.85
	....	....	....	....	....	....	....	....

Bullion Shipments.

Hanauer, June 25, $5,545; Horn Silver, 25, $6,000; Ontario, 25, $6,789; Crescent, 26, $2,200; Day, 26, $4,484; Horn Silver, 26, $6,000; Ontario, 26, $4,620; Horn Silver, 27, $9,000; Ontario, 27, $4,665; Crescent, 27, $2,450; Hanauer, 27, $5,050; Ontario, 28, $4,121; Hanauer, 28, $2,100. From Battle Mountain, week ending June 21, $97,000; Bonanza King, 27, $6,467; Bodie, 24, $17,860; Contention, 28, $6,996; Navajo, July 3, $8,000; Standard, June 30, $13,975; Bodie, July 1, $7,471; Standard, 3, $13,975.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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Sales at San Francisco Stock Exchange

THURSDAY A. M., July 3.		800 Union	.80c
340 Alta	2.15	130 Yellow Jacket	1.90
570 Bodie Con	3.45@3.55	AFTERNOON SESSION.	
800 Benton	.55c	250 Andes	.40c
340 B. & Belcher	2.40@2.50	550 Alta	2.05@2.10
50 Belle Isle	.70c	755 Bodie	3.30@3.35
50 Belcher	.75c	520 B. & Belcher	2.10@2.15
200 Bulwer	.50c	200 Benton Con	.50@.55c
50 Bullion	.45c	300 Belle Isle	.65c
800 Con. Virginia	.30c	105 California	.25c
1340 Chollar	2.30@3.35	250 Chollar	2.05
400 California	.25@.30c	30 Con. Virginia	.25c
50 Con. Imperial	.10c	50 Crown Point	1.20
415 Crown Point	1.20@1.40	25 Eureka Con	.21
100 Caledonia	.10c	740 Gould & Curry	.85@90c
340 Exchequer	.30c	425 Hale & Nor	2.80@2.85
1870 Hale & Nor	3.15@3.20	190 Mexican	.85c
370 Gould & Curry	1.00	400 Mono	.55c
475 Mono	.60@65c	100 Navajo	4.05
120 Mexican	1.00	300 Ophir	.85c
250 Navajo	4.15	100 Occidental	1.25
650 Ophir	.90@95c	850 Potosi	.80@85c
70 Occidental	1.30	785 Sierra Nevada	1.05@1.10
100 Potosi	.95c	1000 Savage	.80c
200 Savage	.85@90c	50 Syndicate	.45c
710 Sierra Nevada	1.30@1.35	70 Union	.70c
1250 Scorpion	.15c	50 Utah	.35c
10 Seg. Belcher	1¼		

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, July 2, 1884.

ANTIMONY—Per pound		14 @	15
BORAX—Per Pound (extra)		16 @	—
IRON—Glengarnockton	25	4 0 @	—
Eglinton, ton		20 00 @	—
American Soft, ton		29 00 @	—
Oregon Pig, ton		— @	—
Clipper Gap, Nos. 1 to 4		32 50 @35	00
Refined Bar		3¾@	3
Horseshoes, keg		5 50 @	—
Nail Rod		7½@	—
Norway, according to thickness		6¼@	7½
STEEL—English Cast, lb		15 @	16
Black Diamond, ordinary sizes		14 @	—
Drill		15 @	—
Machinery		12 @	14
COPPER—Ingot		22 @	—
Braziers' sizes		25	27
Fire-box sheets		28 @	—
Bolt		25 @	—
Old		8 @	—
Bar		— @	—
Cement, 100 fine		12 @	—
LEAD—Pig		4½@	4
Bar		— @	6
Pipe		7 @	—
Sheet		8 @	—
Shot, discount 10% on 500 bags: Drop, ₱ bag	2	10 @	—
Buck, ₱ bag	2	30 @	—
Chilled, do	2	50 @	—
TIN PLATES.—Charcoal	7	00 @	7 25
Coke	6	00 @	6 75
Terne	6	15 @	—
I. C. Charcoal R oofing, 14x20	6	25 @	6 50
ZINC—By the cas k		19 @	—
Sh eet, 7x3 ft, 7 to 10 lb, less the cask		9 @	10
NAILS—Assorted sizes	3	25 @	—
QUICKSILVER By the flask	29	50 @	—
Flasks, new	1	05 @	—
Flasks, old		85 @	—

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ASSESSMENT NOTICE.

Gould & Curry Silver Mining Company.

ASSESSMENT No. 48.

Levied ..... June 6, 1884.
Delinquent ..... July 11, 1884.
Day of sale ..... August 4, 1884.
Amount ..... Fifty cents per share.

ALFRED K. DURBROW, Secretary.

OFFICE—Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.

The German Savings and Loan Society.

For the half-year ending June 30, 1884, the Board of Directors of the GERMAN SAVINGS AND LOAN SOCIETY has declared a dividend on Term Deposits at the rate of four and thirty-two one-hundredths (4 32-100) per cent per annum, and on Ordinary Deposits at the rate of three and six-tenths (3 6-10) per cent per annum, payable on and after the 1st day of July, 1884. By order

GEO. LETTE, Secretary.

California Inventors

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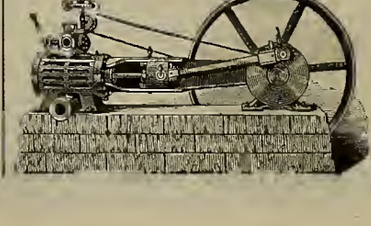

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING JUNE 24, 1884.

300,843.—FIRE ESCAPE.—J. H. Burks, Los Angeles, Cal.

300,765.—CAR COUPLING—Compton & Lane, Williams, Cal.

301,046.—CAR COUPLING—Coon & Hahn, S. F.

300,772.—CARRIAGE FOR GARDEN HOSE—Geo. Grisel, Oakland.

301,060.—SEWING MACHINE—Edw. Kohler, S. F.

300,881.—WINDOW SCREEN—E. E. Masters, Sacramento.

300,925.—FRUIT DRIER—W. A. Mecker, S. F.

300,804.—AMPLIFIER—Geo. F. Schihl, Vallejo.

300,810.—SAFETY HOOK—E. H. Smith, Rutherford, Cal.

301,074.—SUPERHEATER FOR ENGINES—J. Ch. H. Stut, S. F.

301,038.—SCREW AND TOGGLE LEVER PRESS—Wm. H. Worth, Petaluma.

NOTE. Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

GRAIN SEPARATOR.—Pontalia L. Nash, Hollister. No. 295,668. Dated March 25, 1884. The improvements covered by this patent mainly consist of certain details of construction difficult of intelligent description without the aid of engravings.

WATER COOLER AND REFRIGERATOR.—Clayton S. Richman, Vallejo, Marin Co. No. 300,511. Dated June 17, 1884. This water cooler has a movable top and reservoir, outlet pipe and spraying vessel, combined with a drawer valve, discharge cock and ice chamber, and a rod connecting the said cocks, by which they are operated simultaneously.

SCREW AND TOGGLE LEVER PRESSES.—Wm. H. Worth, Petaluma. No. 301,038. Dated June 24, 1884. This invention relates to improvements in cider, cheese, wine or other similar presses in which double toggle levers are employed, with a right and left hand screw shaft, by which they are operated; and it consists in a means for keeping the power and strain of the press in a right line, so ae to avoid all cramping and warping of the parts.

FARM GATE.—Edwin D. Rathbun, Williams, Colusa Co., Cal. No. 295,674. Dated March 25, 1884. This invention relates to that class of gates which are opened and closed by the operation of levers on the side of the doorway, and it consists in the novel construction and arrangement of the devices for operating the gate and the latch, and in a peculiar guard to prevent the gate from being opened except by the proper means.

SAWMILL.—Peter McG. Chisholm, San Francisco. No. 300,216. Dated June 10, 1884. This patent covers an improvement in sawmills, consisting in a portable frame, a pawl and rachet mechanism for adjusting the set beam, a friction with a boxing for friction shaft, an adjustable box for the saw shaft, and a guard for the saw. The object of the invention is generally to render more perfect and operative the several parts.

VEHICLE.—Jacob Price, San Leandro. No. 297,714. Dated April 29, 1884. This improvement in vehicles consists of a frame, the side pieces of which are formed of continuous bars of flanged or angle iron, with lugs for the attachment of the seat or other parts, and curved strengthening ribs at the points where bends are made. This frame is designed specially for phaeton village carts and light-riding carriages. The side bars are shaped to form the body.

COMBINED BUCKLE AND RING.—James B. Sayre, Sacramento. No 299,271. Dated May 27, 1884. This is a new and useful buckle and ring for harness; more especially for halters. It consists in a novel arrangement and construction of the buckle frame, tongue-keeper, ring and guide lip between the ring and keeper. The device has for its object the saving of expense and at the same time the attainment of the best results of a single ring and for a proper direction and equalizing of the strain.

DRY CLOSET.—Thomas W. Jackson, S. F. No. 299,226. Dated May 27, 1884. This is one of that class of closets in which some auxiliary means or substance such as dirt, sand, ashes, earth, etc., is employed to obviate the offensiveness of excrement. It consists of a peculiar endless receptacle mounted under and adapted to receive the feces from a closet seat, a novel means for depositing on said receptacle with the feces, such substances as ashes, earth or sand; means for drying the contents of the receptable and ventilating it, and a mechanism for causing the movement of the endless receptacle, whereby its contents are carried forward and discharged. The object is to provide a convenient and dry closet, the excrement from which may be discharged readily and without offense and at the same time is valuable as a fertilizer.

POULTRY FOUNTAIN.—John C. Tappeiner, Bisbee, Arizona. No. 294,932. Dated Mar. 11, 1884. The invention relates to certain improvements in poultry fountains of that class in which water contained in a reservoir is allowed to escape by degrees into a shallow pan. The top of the reservoir is provided with a removable cap and a perforated vessel is fixed or suspended within the reservoir. There are certain combinations of devices which go to make up the invention.

EARTH BORING AUGER.—Camille de Mezor ville, Santa Clara, Santa Clara county. No. 300,053. Dated June 10, 1884. This is a new and useful device for boring holes in the earth for trees or posts, and it consists in a wheeled frame carrying the earth auger, the shank of which is a screw, upon which are fitted a nut and washer, each of which is adapted to receive a pole or lever for operating them to cause the insertion and withdrawal of the auger, the power being applied in a single direction.

WINDOW SCREEN.—Egbert E. Masters, Sacramento. No. 300,881. Dated June 24, 1884. This consists in an ordinary window frame, provided with the usual sliding sashes, and having located between them, and adapted to slide on the parting-strip throughout the length of the window, a screen-sash. A peculiar jointed and removable parting-strip, which allows the ready insertion and removal of the screen-sash, and the construction of the screen-sash itself, are details of construction forming part of the invention.

SOLDERING MACHINE.—Mathias Jenseu, Astoria, Oregon; assignor of two-thirds to John Fox and Alsey L. Fox, same place. No. 300,084. Dated June 10, 1883. This is an apparatus for soldering cylindrical cans and similar articles. It consists of a circular bed, within which the solder is melted by means of a fire beneath it, a central revolving disk with arms projecting from its edge, and a mechanism by which it is revolved, so that the cans which are delivered into the space between the arms from a chute will be rolled around the edge to be soldered within the melted solder in the bed or pan, and after completion will be discharged through another chute.

HORSE DETACHER.—Octave Dupas, San Rafael, Marin county, Cal. Assignee of one-half to Isaac Shaver, same place. No. 300,056. Dated June 10, 1884. This apparatus is intended for detaching or clearing a horse from the shafts and whiffletree of a wagon when said release becomes necessary for the safety of the riders, upon the horse running away or becoming frightened. The apparatue consiste in a pointed latched hook on one end of the whiffletree, and a peculiar bevelled hook on the other, and of a spring releasing guard on the ehafts through which the breeching of the harness is passed. The horse can be released in the easiest manner and accident or injury prevented. Thie device is applicable to buggies, carriages or other vehicles, and may be used with shafts or poles, for single or double teams.

COMBINED PEN HOLDER AND BLOTTER.—J. J. Franklin Miller, Oakland, No. 296,668. Dated June 3, 1884. This combined pen-holder and blotter consists of a pen-holder having secured to the top of its staff a light frame, a plate carrying a blotting pad. Its object is to facilitate the work of book-keepers, accountants, entry clerks and those whose work demands the writing in various parts and places, of small entries and the turning of sheets and pages. The blotting sheet, of all the articles about a desk is the most easily mislaid or covered up, and no small loss of time and considerable vexation are occasioned by a search for it. This inconvenience is particularly noticeable to those who have but a few words or figures to write here and there. With the blotter attached to the pen-holder, where it cannot be mislaid, its use ie convenient and rapid.

CABLE GRIP.—Ralph W. McGovern, S. F. No. 300,492. Dated June 17, 1884. In the usual construction of grips of cable roads there are two compressing jaws between which the cable is clamped; but the clamp cannot he put on with full force instantaneously or it would jerk the car in starting. The cable slips slightly through the grip and of course wears the cable. Rollers have been employed but are not entirely satisfactory. Mr. McGovern's invention is designed to overcome the difficulties of the present system and prevent slipping. It consists in suitably mounted and operated rollers or pulleys between which the cable is gripped, said rollere being either eccentrically mounted or provided with eccentric or cam-shaped faces, and geared together in pairs, whereby their eccentricity ie made to correspond to bind the cable and supplement the clamping pressure by which they first take hold of the cable. It further consists in novel mechanism for operating the gripping rollers, and in various details of construction.

PLOW.—John A. Bilz, Pleasanton, Alameda Co., No. 299,195. Dated May 27, 1884. This is one of that class of plows known as vineyard plows which are especially adapted for vineyards and orchards, where it is necessary to get the share close to the vine or tree without injuring its branches. The invention consists in a peculiarly bent or curved beam mounted in bearings, and adapted to turn or revolve therein, in laterally adjustable handles, and in a novel whipple-tree. The object is to provide a plow in which, by turning the team, the line or draft is moved to one side, to prevent the horse from injuring the vine or tree by allowing him to clear the branches while the share works up close under them, and to give the same advantage to the driver by moving the handles to one side to get them in the line of the draft. The whipple-tree is arranged so it can do no injury by contact with the trees.

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After the first of April, 1884, we announced a reduction of the price of the MINING AND SCIENTIFIC PRESS from $4 to $3 a year to all who would settle up arrearages at old rates and pay *in advance* thereafter. There are some who have not yet taken advantage of this offer, and we would therefore urge all subscribers still in arrears to remit what is due us to this date, at the rate of $4 a year, and pay in advance for another term at the reduced rates for new subscriptions paid in advance.

THE PALISADE FURNACE.—There are 300 tons of ore at the Palisade furnace. Two car loads of flux ore were shipped there from Mineral Hill a few days ago. The furnace will now start up within three or four days more, everything being got in readiness for the work of reduction. It is calculated that the ores from Shroeder District and a large quantity from Mineral Hill can be worked at a profit in the Palisade furnace. Its starting up is awaited with interest. It is an important event to the northern part of the country.—*Eureka Sentinel.*

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time they intend to pay for it*, let them not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First street, a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below costs, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. References as to above can be had upon applying to this office.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward' Gardens is a day well spent

Lost Papers.

If any subscriber fails to receive this paper promptly, after making due inquiries at the Postoffice, he is urgently requested to notify this office by *letter*, that we may send the missing papers, and, if possible, guard against further irregularities

The Wellington Coal Mine Disaster.

On Monday last a tremendous explosion occurred at the South Wellington Coal mines, British Columbia. Miners, women and children rushed to the mouth of shaft No. 3, whence the sound had emanated, and in a few minutes a party of rescuers descended. The volumes of smoke that rolled along the passages in the levels almost overcame those who had thus early commenced the search for any who might have escaped with their lives. The fumes of the gas also were nearly unbearable and prevented the rescuers staying below more than a few moments at a time. In the dark stalls the dim light of the Davy lamp revealed a heart-rending spectacle. There lay two brothers, blackened almost beyond recognition. Further on, in another stall, was found the body of a miner with the head reduced to a pulp. Several were alive when found and brought to the surface, where their injuries were attended to. The search was continued till midday, when the accumulation of after-damp became so great as to compel the work to be postponed. Seventeen bodies had been recovered. The men were just going down to work at the time, and had the explosion occurred a few minutes later the loss of life would have been nearly doubled. Thirty lives in all are reported to have been lost.

At 9 o'clock Monday night seventeen bodies of the victims had been recovered and laid out in a room at the top of the mine, besides six more whose bodies had not been brought up. Three miners are reported as missing. The mine was on fire in some parts and the accumulation of foul gas prevented further search being made.

The actual cause of the explosion was owing to the iguition of foul gas, which occasionally prevaded shaft No. 3, the scene of the disaster, and, in consequence of this known liability, it was the duty of the foreman to go down with a Davy safety lamp every morning, and report as to the condition of the various parts of the mine, registering such report in a book kept for the purpose. It is now said that he reported that morning that everything was safe, without having previously ascertained by going down into the mine. The first inquiry Mr. Dunsmuir made upon arriving upon the scene was for this man, but he was not to be found. Should he be discovered he will be arrested pending an inquiry, and the indignation against him is great amongst the miners.

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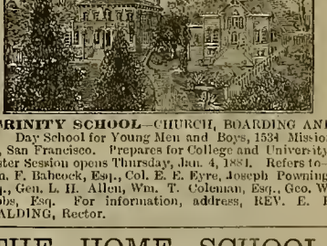

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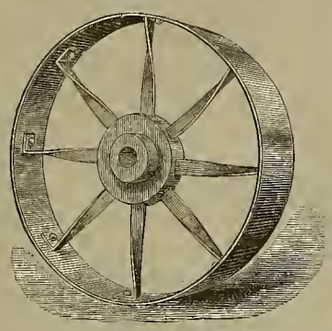

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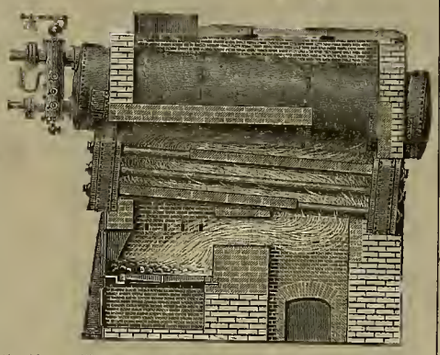

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To Mr. H. Heine, Civil Engineer: In reply to your inquiry of September 20, we respectfully inform you that the three boilers built under your patents, under steam since September 25, 1881, at the Alexander Place Depot, as well as the two at Friedrich Strasse Depot, under steam since September 22, 1882, have given good satisfaction, requiring no repairs whatsoever to date. The internal cleaning of the boiler was always accomplished with ease on account of the convenient arrangement of the tube caps, the adhesion of scales being fully prevented thereby, and the boilers kept in prime condition.

(Signed): BRAUCKE.

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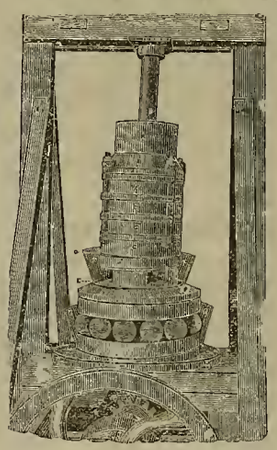

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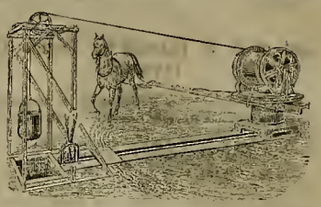

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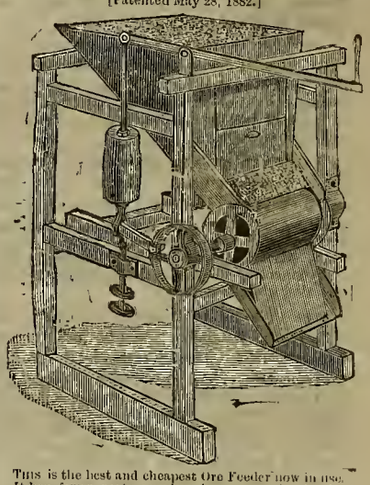

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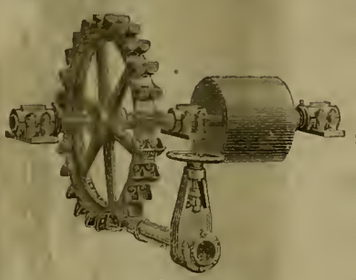

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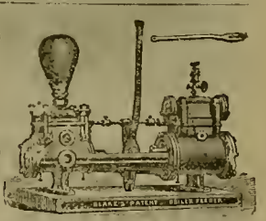

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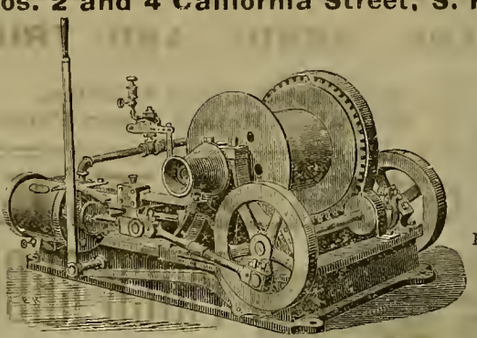

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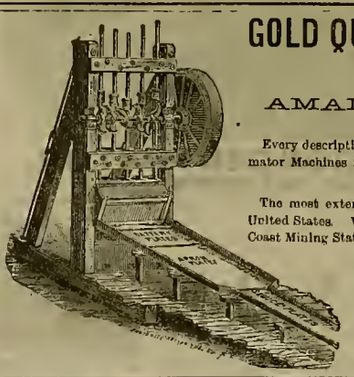

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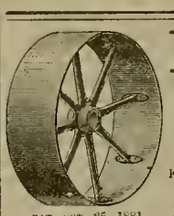

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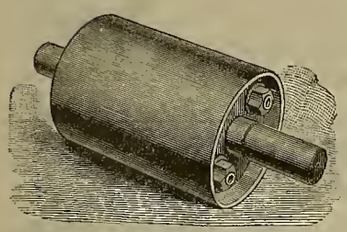

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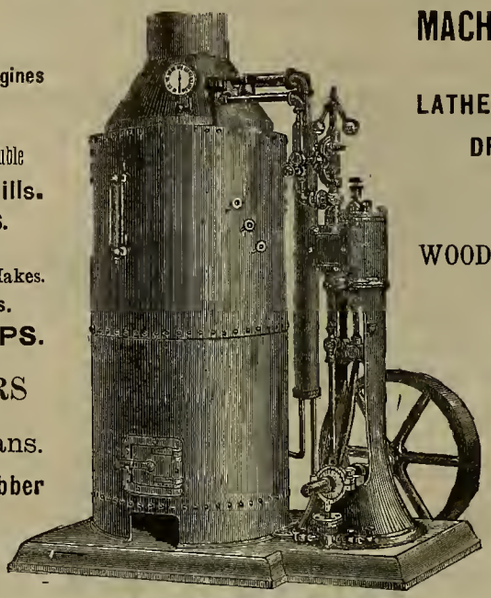

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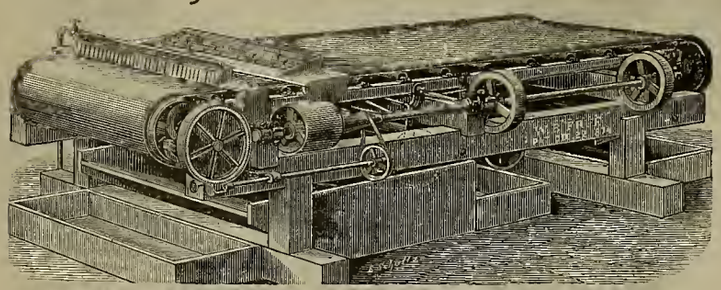

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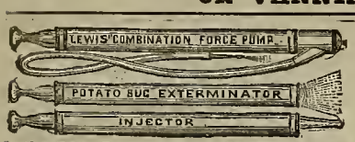

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MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO, SATURDAY, JULY 12, 1884.

VOLUME XLIX Number 2.

New Form of Steel Drill Bar.

On this page are engravings representing Hammond's steel drill bar, which possesses several advantages over those forms commonly in use. In forging drill bits out of octagon steel, now in general use, it is necessary to manipulate from three to six inches of the bar, (according to its size and the diameter of the holes required), and to re-heat the same in the hearth an equal number of times before it can be drawn down to the cross-section (as shown at Fig. 2), which process occupies both considerable time and labor. With the improved bars, on account of their rolled construction, this result is obtained in the first operation, inasmuch as it is only once necessary to heat from one-half to one and one-half inches of their ends (according to size of bar), when, by the aid of the dolly or swedge, shown at Fig. 3, the X bit can be almost instantly formed. The saving in time and labor is computed by practical skilled experience as ten to one.

It is well known to all parties conversant in the manufacture and uses of drill and tool steel that each and every re-heat or contact with fire has a tendency to destroy its chemical cohesiveness, and to absorb, more or less, some of the deleterious gases and properties contained in fuel used for smiths' hearths, in consequence of which the quality of life or the steel becomes deteriorated, and no amount of skill in the operator, by tempering, can regain its full pristine strength. This effect in the Bonanza bars is reduced to a minimum, owing to the short length of bar to be heated, and even this can be *totally* obviated by the smith or workman burying a foot of 2 to 3-inch wrought iron tube in the fire, and inserting therein the end of the bar to be operated upon, as the tube will protect it from the sulphurous, phosphorous, and other obnoxious elements to be found in the fuel.

Further, it will be seen that the edges or corners of these bars can more readily remove when rotating any debris that may fall between them and the sides of the holes being drilled, whilst the four continuous semi-circular grooves serve as an outlet to the same, thus preventing the bar from becoming clogged, and consequently allowing the drill to work more uniformly.

In drilling in a direct vertical position it will be found that this section of bars, when rotating, acts as a spiral screw, and deposits the debris in larger quantities on the surface of the ground than can be done by those of other configuration.

The great desideratum, and a consequent saving of expense in weight, is obtained by using smaller sized bars of the patented form than would be required of other well known sections to drill holes of the same diameter. For example, with the one-inch bar the inventor says he can drill a hole 1⅜ inch diameter without any upsetting, which is demonstrated by drawing a line through the two diagonally opposing edges or corners.

These drills are made from the finest quality of crucible steel used for that purpose, and its many described advantages are such as to specially recommend it to the attention of all concerned in mining and quarrying operations.

Fig. 1 represents the rolled form and section. Fig. 2, the same with the X bit ready for use. Fig. 3, the dolly or swedge used in upsetting the X bit.

The following advantages, amongst others, are claimed for this improved bonanza steel drill bar, viz: That the smith is saved much time and labor in producing the requisite X shaped bit. That any miner, prospector or unskilled workman (where skilled labor is scarce) can upset his own drill bar, with a dolly or swedge, as shown. That the original quality of the steel, owing to no reheating being requisite, is more fully retained, and has a longer lasting capacity. That it more readily frees itself from the debris, and thus prevents clogging, consequently works with more uniformity, and with less strain to the drill. That it combines strength, with economy in weight, requiring smaller sized bonanza bars to drill holes of equal diameter, than can be accomplished by bars of other sections, of the same dimensions, and same amount of upsetting. Mr. Hy. Woodcroft Hammond, the inventor of this bar, has an office at room 18, 309 Montgomery street, in this city.

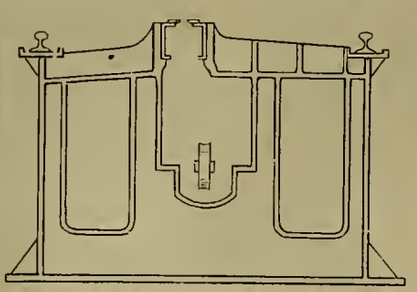

Fig. 1.—FRAME AND TUBE FOR CABLE RAILROAD.

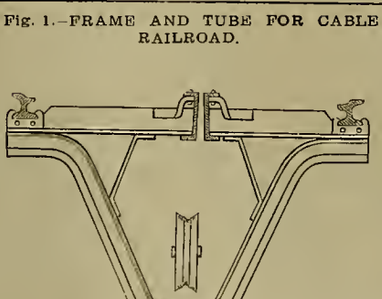

Fig. 2.—FRAME AND TUBE OF CALIFORNIA STREET ROAD.

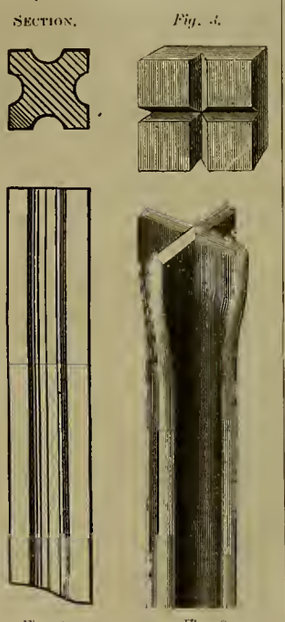

Fig. 1. Fig. 2.

HAMMOND'S BONANZA STEEL DRILL BAR.

Foundry Notes.

Business at the local foundries has been dull for some time past, and the slack time still continues. There is comparatively little mining machinery being made just now, that is in large orders, though of course there is more or less repair work, miscellaneous work etc., on hand.

The Risdon Iron Works have a large contract on hand for the Spring Valley Water Company, building some 27 miles of iron pipe for bringing water to the city. Most of this is 24 inch but some of it is 40. The pipe is made of the best quality of iron. A large two story building reaching from street to street has been erected to carry on this work conveniently, and special tools have been constructed for cutting, punching, riveting and handling the pipe. A large number of men are employed. After the pipe is made it is dipped in a coal tar mixture.

The San Francisco Tool Company are engaged in making some special large machinery for the new plant of the Union Iron works. They are also making machine tools for stock, and a number of centrifugal pumps for irrigating purposes.

The Dow Steam Pump Co., are making a number of their special pumps for local orders.

The Pacific Iron and Nail Works have been shut down for a week for overhauling and repair. New offices have been obtained in the city.

The Union Iron Works have been busy for weeks past moving their tools and machinery to their new quarters on the Portrero. The bulk of the material has been moved, though there is still considerable to be taken over. They have made a contract to build an iron steamer—the first one constructed on this coast—with all her machinery.

The Judson Manufacturing Company have been putting up new buildings and adding to their facilities.

At the iron mine of the California Iron and Steel Co., Hotaling, they have been refitting and improving the works. The company has just completed the erection of six new patent coal kilns, with a capacity of 50 cords of wood or 2,000 bushels of coal per kiln within a short distance from the furnace. They have contracted with all the timber owners within a radius of two or three miles for their wood, which will all be turned to coal in these kilns. Under the supervision of Mr. Secly they have re-lined the furnace with fire-brick procured in Pennsylvania at great expense, and equipped it with all the latest blast-furnace machinery and appliances; have remodelled and enlarged the hot-blast, and, it is rumored, will soon receive from the East a large and improved blowing engine. They have about 4,000 tons of ore on hand, and are hoisting more, night and day, at No. 1 shaft. About the middle of last January the company commenced sinking a shaft near the works. It is a two-compartment shaft, and it is the intention to run two safety cages therein. They use two compressed air drilling machines in sinking. It is thought the main ledge will be tapped at a depth of 300 feet. This will then become the main shaft and supply the furnace with ore. Millwrights are now ground framing timbers for large hoisting works soon to be erected over the new shaft.

Cable Railroad Frames and Tubes.

When the Clay Street Hill Cable railroad was first built, wood was used to a large extent. Cast-iron frames were made to conform to the desired cross section of the tube and placed about three feet apart, they having ribs cast on them so that planks two inches thick could be laid from one to another and held in position by the ribs thus forming a tube of wood, with supporting ribs of cast iron.

Ties extend laterally from these cast-iron ribs, upon the outer ends of which are placed stringers which carry the rails. The castings are open at the top, so that the vertical part of the grip may pass through, and close on each side of this opening, extending from one casting to another, are short car-lines, which are bolted at each end to the casting, thus keeping them at the proper distance apart and maintaining them in proper position. On top of these, and extending over several of the castings, are laid wood scantlings, which form the slot, and to protect the top from wear are placed iron straps fastened to the scantlings by wood screws. The surface of the roadway between the slots and the rails on each side is formed of wood plank.

At the last meeting of the Technical Society of the Pacific Coast, Mr. W. W. Hanscom, Mechanical Engineer, read a paper on Cable Railway Propulsion, in which, among other things, he described the construction of the frames. In speaking of the Clay street road, he says:

"As this road was extended after having been in operation about five years, some changes were made in the construction of the tube and in the cast-iron frame (Fig. 1) which was extended laterally, so that it now comes under and supports the rails, and has its base extending the same distance, the web being perforated in the centre to the shape of the tube, and also openings between the central, and each side, ribs or flanges being formed all around the openings and the outside of the frame. The tube in the extension is formed of concrete, and as it passes through the openings of the frame it forms a monolithic structure the length of the road to which this mode of construction is applied. The slot is formed by channel irons six inches deep, with two-inch angles top and bottom bolted to the casting, and wood carlines are placed from frame to frame only to support the wood plank which forms the street surface between the rails.

The tube on the California street road (Fig. 2) is constructed of a frame of wrought-iron, reaching out and supporting the rails, which was copied in the later construction of portions of the Sutter street road above alluded to. In the case of the California street road, however, the main element of the wrought-iron works was made of old rails.

WORK has been suspended at the Washington Navy Yard, owing to the failure of Congress to make an appropriation for its continuance.

CORRESPONDENCE.

We commit, unendorsed, opinions of correspondents.—EDS.

An El Dorado County Iron Mine.

[Written for the PRESS by C. B. T.]

The time has arrived when those in this State who are interested in mining are beginning to devote their energies to something beside the search for gold and silver. There is no question but that California is possessed of enormous mineral wealth, and that the day is not far distant when iron will be one of her leading resources. It has been known that this mineral was to be found, but the mining of it has been neglected. A very old English work in the writer's possession concludes an account of California in these words: "And it is thought that there are mines to be found in several places if they were sought for." This sentence, published in 1748, was prophetic. That iron exists in this State is an established fact. The developing of the mine near Clipper Gap has turned attention to the neglected industry. It is reasonable to suppose, and assays demonstrate the fact, that there is equally as good, if not better, iron ore elsewhere than at the mine just mentioned.

Many will remember the excitement that existed about twenty years ago regarding copper. That resource has lain undeveloped. This is principally due, in all probability, to the fact that the working of the ore required more skill and experience than was at hand, and also to the added fact that the mines were not easy of access for shipping. Large sums were spent at Copperopolis, but for years the works have been idle.

Everything points to a brighter future for the iron mining industry. There is an enormous demand for iron here. The railroads which are built consume a large quantity. As the country settles up, and as the foothills throughout the entire length of the State are transformed into the orchards and vineyards for which they are so well adapted; as little homesteads become more plenty along the hill slopes, there will be required a large number of small railroads to carry away the produce. The expense of rails has always been a great hindrance to railroad building in California. The production and manufacture of those rails here will greatly obviate this and will make possible the building of many short roads. As these penetrate the hills and as the whistle of the locomotive echoes up the ravines more houses will be built and more orchards and vineyards set out, because people will then have the assurance that their fruit can be transported to market. The relations existing between a railroad building in a country and the setting up and developing of its resources are reciprocal. What helps the one benefits the other; a retarding of one keeps back the progress of the other.

But there is another side to the iron industry. Besides the men engaged in its mining it gives employment to many more. The manufactories of a country are the salvation of its laboring inhabitants. There they find their proper spheres in the doing of that for which they are adapted. A man in a factory must understand his work, and the greater his knowledge, so much the more he receives for his labor. He may be a hewer of wood, or a drawer of water if he likes or he may be a mechanic laboring on a higher plane, actuated by ambition, endowed with capacity and achieving success.

California is gradually becoming a manufacturing State. There is no reason why she should not be celebrated as such. We have the raw material and we will have the markets for our factory products when we have such to ship. There is no country which will be able to offer to the factory hands more inducements whenever we have the manufactories. It has been frequently mentioned by various writers that the expenses of living here are much less than elsewhere, when it is considered that the general mildness and evenness of the climate in different parts of the State reduce the expenses for fuel and clothing to a minimum, the cause is partly found. The necessaries of life can be produced here equally as cheaply, if not for less than in most places. Therefore, possessing these advantages, that the factory hand will be able to labor comfortably and to live cheaply, there can be no doubt but what there will be an ample immigration of such as soon as there is work for them. The possession of the material to be worked in the factories will cause such to be built with laborers and with factories to demand and consume the raw material, increased attention will be turned to many industries that have heretofore lain dormant, and among all these that of iron mining promises to be one of the first to come into prominence.

Having seen several fine specimens of iron ore from a mine that is being opened in El Dorado county, between the Middle and South forks of the American river, and about eight miles from the town of Folsom, the writer gladly availed himself of the opportunity, while attending to other business to visit the interesting locality. Leaving Roseville, which is in Placer county, just where the hills are losing themselves in the plains, in company with Mr. J. L. Bulens, of that place, we rode to the mine, by way of Folsom and Mormon island.

About three miles east of Roseville, we reach a section, a great part of which has been mined over. These were surface diggings and were worked by Chinamen. The income was about a dollar and a half a day to the man. John came here to slake his thirst for gold in this humble manner because the places which paid better were appropriated by the whites. We pass the mouth of a little ravine which has been mined for miles, here the return was quite good.

The shaft on the iron mine is down about 30 feet, and discloses a vein of iron ore about three feet wide. This ore was assayed by Prof. Boynton of the Normal school in Bridgewater, Mass., and the result was, for the first assay 85 per cent iron, for the second 84.4 per cent. Several other assays have been made, the average of all being 75. Recently three hundred pounds of the ore were worked at the new steel works at Martinez, and a small rail was the result. The converting of the ore into steel rail can be done, it is stated, at a cost of two cents per pound. If this is the case there seems no reason why we cannot produce our own steel rails and develop the factories referred to at the beginning of this article. Everything indicates that the entire mountain contains iron. Pieces of the surface rock taken some 300 feet up hill from the shaft show plainly the indications of the metal. The surveyors found, when laying out the lines, that their compasses would not work. Messrs. Bulens and J. D. Pratt, who are heavy owners in the mine, are very sanguine and everything seems to indicate that they have no cause to be otherwise. One thing in favor of the location, aside from the abundance and high grade of the ore, is that the mountain can be tunneled from several points, and that thus the ledge or ledges—for there appear to be many—can be tapped from 300 to 500 feet from the surface. Thus the expense of hoisting the ore will be avoided. The mouths of the tunnels would be in a little valley, and the road from there to Folsom, which would be the shipping point, would be a good one over which to haul. Indeed, a railroad might be easily built, and the ore loaded into cars at the mouth of the tunnels. The heaviest expense in such an undertaking would be a bridge across the South Fork, but in consideration of the advantages to be derived therefrom, this would probably not long stand in the way of such an improvement. We understand that San Francisco parties are looking into the matter, and it is quite probable that this will be one of the leading iron mines of the State. It is certainly to be hoped that the enterprising discoverers will not rest until they have fully proven the extent of their find. We need iron mines, and when such apparently valuable ones are found, so easy of access and possessing so many great advantages, the best interests of the State demand that everything should be done to develop them.

Another Overland Railroad.

The California and Nevada Railroad has been started and is progressing towards completion in a very energetic but quiet way—so quiet that but few, even of our business people, are fully aware that such a road is really in process of construction. This road is already under contract to be built to Bodie, which town is situated almost directly upon the easterly line dividing California from Nevada, at which point it will be met by a road coming this way from the Denver and Rio Grande. The latter road is already constructed to Salina, a point about 210 miles due south from Salt Lake City. From that point to Bodie the distance is only about 600 miles, over a country very favorable for railroad construction.

The entire road will be of a uniform narrow gauge, corresponding to the Denver and Rio Grande, to the eastern terminus of the road. Starting from Oakland, the road runs northward to San Pablo, thence eastwardly and southerly over the Coast Range to Walnut creek. From that point a branch will probably be constructed directly to Stockton, while the main road will be continued southwardly and eastwardly across the San Joaquin valley to Modesto, thence to Sonora and over the Sierra by way of the well known Sonora pass. It will cross the summit at a point about 55 miles north of the Yosemite valley. At Bodie it also connects with the partially constructed Carson and Colorado Railroad, which will soon be completed along the eastern slope of the Sierras to a connection with the Southern Pacific, which runs from Mohave to the Colorado at the Needles. The California and Nevada Narrow Gauge will be in full and close connection with the extensive and rapidly growing narrow gauge railroad systems in Neveda, Utah and Colorado, and with its connecting roads will be the most direct and shortest railroad line between San Francisco and New York.

Its route through California passes through a superior portion of the State, without really paralleling any other road, thus developing for itself a new and rapidly-growing field of traffic through Alameda, Contra Costa, San Joaquin, Stanislaus, Tuolumne and Mono counties.

As already stated, the grading of the entire road is under contract, to be completed in four years from March last. Contracts for a large amount of rails have also been made; also rolling stock. The rails have already been laid six miles from the landing, and the first locomotive is now on its way to San Francisco. It is expected that cars will be running to Walnut creek by January 1, 1885. The track is already graded a distance of over twenty miles. The Oakland terminus will be at a point near the Judson Iron Works, and the landing in this city has been temporarily fixed at the Saucelito ferry slip. This road will probably form the trunk line to a complete system of narrow gauge railroad, which will probably be extended throughout all the important interior portions of the State. Its connections with the Rio Grande of Colorado, and the general narrow gauge system of Utah and Nevada, together with the unlimited amount of capital at the command of these roads will insure for this a fairly competing transcontinental road, which is one of California's greatest needs.

The Poetsch System of Mining in Quicksand.

Through the kindness of Mr. A. Bernay, representative in this country of Mr. F. H. Poetsch, the inventor of a novel method of driving and sinking through quicksands, repeatedly alluded to in the *Engineering and Mining Journal*, we are in a position to submit some additional details. Thus far, mining enterprises in this country have been comparatively little troubled with the necessity of overcoming difficulties due to works in quicksand. It has been reserved for railroad engineers engaged in tunnel work, and civil engineers in sewerage and foundation work, to gather sad experience in this character of ground. Still such emergencies are likly to and do arise at any moment, and Mr. Poetsch's simple and successful method does away with the uncertainty and no small share of the cost of such work. The method has attracted a good deal of attention abroad, and can boast of quite a literature, though only brought out a short time ago. The best, though not the most recent account, is that of Dr. Max Weitz, of Aschersleben, an associate of Mr. Poetsch in his work. From his paper printed in the *Zeitschrift fur das Berg-Hutten-und Salinen-Wesen*, and from other sources, we take the following:

The object of the new method is to convert the quicksand into a solid mass, or surround that part yet to be extracted in driving a tunnel or making a shaft with a solid wall of ice, impervious to water, thereby avoiding the use of pumping machinery and of heavy timbering. Poetsch converts the quicksand into a solid mass by circulating a very cold solution through a system of pipes driven into the treacherous ground. After making a series of preliminary experiments, which convinced him of the correctness of his idea, Mr. Poetsch undertook his first work at the Archibald lignite mine, near Schmeidlingen. The shaft, 15 by 10 feet, had been sunk to a depth of 107 feet through rock, but was separated from the bed of lignite by a 5.5 meter stratum of quicksand. By piling, an effort had been made to put it through, but the work had to be abandoned after the shaft had got 1.3 meters below water-level. In order to give the water relief, a hole had been drilled in the center of the shaft into a level in the coal below it, a circumstance that was not without its effect upon the execution of Mr. Poetsch's work.

Mr. Poetsch sank 23 pipes, ten of them along the walls of the shaft, through the quicksand and 15 feet into the liquid under it, the diameter of the pipes being 200 millimeters. At their lower ends, these pipes had an inner conical attachment against which a wooden plug was driven from above, thus closing the pipes below. After emptying the pipe with a sand-pump, the bottom was plugged with a layer of 6 centimeters of cement, 6 centimeters of gypsum, and 6 centimeters of loam. Into every pipe a second 30-millimeter pipe, open at the lower end, was introduced. The cold solution entered the latter pipe from above, and descending, flowed out of its lower end, flowing upward in the circular space formed between the mines and the outer pipe, a constant circulation being kept up through the ice-machine, which was of the Carre design. In this case, a chloride of calcium solution was employed, which freezes at 40 degrees Celsius below zero. Twenty 1.5 foot pipes were driven into the bottom and the walls of the shaft to measure the temperature. The daily record shows that, at the beginning of the work, on July 8th, 1883, the temperature of the air at the bottom of the shaft was 12 degrees C., and at the four walls 11 degrees C. On the 15th, the figures for the air and the four walls were, respectively—1.5, 6, 4.5, 5 and 7.5. On the 23d, they were—4 for the air, and 14, 17, 14, 13 degrees Celsius for the walls; and on the 31st of the month, 24 days after the beginning of the work, the record stood—6 degrees for the air, and 19, 17.5, 19 and 18 degrees Celsius for the four walls. The temperature was measured immediately when the bottom of the shaft was reached; after awhile, the radiation of heat by the observer carried it upward; and after a number of miners had been steadily at work for some time it ranged from 0.5 to 1 degree.

While the shaft was sinking, which was done within the freezing-pipes, the freezing process was continual. As the shaft was perfectly dry, and the ground had become as hard as sandstone, it was sunk by means of the pick, in sections of 3.29 feet, and was then timbered. On the 30th of September, the lignite was reached, and was found to be frozen for a depth of more than three ft. Its hanging-wall was so closely united with the foot-wall of the quicksand that pieces of both of them did not break on the plane of contact—an important point, showing, as it does, that it is immaterial, so far as the Poetsch system is concerned, whether the quicksand is in a horizontal bed or has a strong dip. After the shaft was sunk, holes were drilled into the ice-wall 1.7 feet above the coal, and measurement showed that at this point there was a column of ice 1.5 meters in diameter around every freezing-pipe. Other measurements showed that the thickness of the ice-wall increases with depth, a fact due probably to the circumstance that the cold solution issues from the inner pipe at its lower end.

The fact that in the Archibald shaft there was a connection with a shaft below had the following advantages: A part of the freezing-pipes, calculated for the whole thickness of the bed of quicksand, were thereby exposed to the air, cooling it instead of a corresponding thickness of ground. There was flowing water that gave rise to great loss by being unnecessarily chilled, and by causing the outer circumference of the ice wall to grow slowly. The same trouble interfered in a more serious manner with the sinking of a shaft at the Max colliery near Michalkowitz, Upper Silesia. Two adjoining shafts had been sunk to a certain depth by ordinary methods, but could not be got down further. They were crammed with timber. Poetsch undertook the contract of putting through one of them within a given time, but a series of break-downs and the crowded condition of the shaft delayed work. Meanwhile the projectors had gone on with the other shaft and succeeded in putting it through just when the work of freezing was beginning with the other. The pumping in the shaft so much interfered with the work that the period for the completion of the shaft passed and the owners ordered work stopped.

The third piece of work was done for Dr. Werner Siemens, at the Centrum mine at Konigs-Wusterhausen, near Berlin. The shaft, 15 feet square was to be put through a 110-foot layer of quicksand. With sixteen freezing-pipes it took 33 days to complete the ice-wall, and in a comparatively short time the shaft had been excavated. A fourth work is now progressing at the Emilie mine, near Finsterwalda, where a 132 foot bed of quicksand is to be passed through with a 12 foot circular shaft, using 12 freezing-pipes.

Mr. Poetsch has proposed to run the system also for the foundations of bridge piers in river sand, modifying it to suit the circumstances of the case. In order to protect the masonry against the low temperature in the excavation protected by the ice-wall, he covers its outer surface nearest the latter with straw or slag-wool, or uses a mixture of tar, pitch, and sand, instead of cement, for outer courses, or finally employs a chloride of magnesium solution instead of water for mixing ordinary cement.

HISTORY OF BORING TOOLS.—A writer says: "The first boring tool may be assumed to be an awl of some kind. Pliny states that Dædalus invented the gimlet in 1240 B. C. It was destitute of a screw point, but it may have had a hollow pod and a cross-head forming a handle. Awls are shown in Egyptian tombs of 1706 and 1490 B. C. The screw point was added to the gimlet in course of time, and within our own recollection the twisted shank, which makes it self-discharging. The hint was taken from the auger proper, which may be called a magnified gimlet, now that their specific features have become so closely assimilated in form and function. The auger (*terebra*) was a Greek tool. From the early descriptions, the auger seems to have been considered a shipwright's tool. It formerly had a curved, sharpened end, and a concavity to hold the chips. This was a poor auger. To this a lip was subsequently added for some kinds of boring, and in course of time the depression grew into a spiral, which allows the chips to escape while the boring proceeds, instead of withdrawing the tool as the pod becomes filled. The twisted auger is the American invention, and was made by Lilley, of Manstield, Conn., about the beginning of the present century, and afterwards by Gurley, of the same place. Augers may be classified as augers, annular augers, taper augers, augers with secondary bores, reamers, or countersinks, or having expansive cutters."

OUR FOREIGN MARKETS.—Too little attention is paid by our manufacturers and producers, in regard to the kind and quality of goods, which are in demand abroad. A more careful study of our consular reports, would be of advantage to our exporters. These reports contain a large amount of valuable information, in the dissemination of which the government is doing a good work for the country, if the people will only accept, and make a proper use of the information so given. In this connection we would add the following, from a late Chicago paper: "With all our activity in production, *and our seeking for foreign markets, we buy much from, and sell little to the countries, lying south and nearest of all the world to us; and that little, moreover represents our least skilled industries. For instance, we sell provisions, lumber, petroleum, etc., and buy of them principally, coffee, hides and skins. At the same time these Southern countries, unskilled in manufactures, purchase all kinds of fine and coarse goods and household articles, almost entirely from Europe. We endeavor to put our products of skilled labor upon the countries which produce already the surplus which supplies our southern continent, Mexico and the West Indies, from a double distance, at what ought to be a greater cost of freight. We also, with the balance of trade greatly against us in those southern countries, furnish through that paid-up annual balance the money that pays for those purchases of European goods."

MECHANICAL PROGRESS.

Present Steam Engine Practice.

It is generally believed that the improvement in steam engine economy that has been made within the last fifteen or twenty years has been owing mainly to the introduction of high-speed practice that all or most of the increase of power for diameter and stroke of cylinder and piston, and most of the economy in fuel, are due to the increased piston speed. To some extent this is true; but it is also true that engines are built on better plans and under the guidance of better mechanical judgment than was formerly possible. Much of this improvement is to be attributed to the increasing use of the indicator, which not only points out the faults of the engine, but designates the reason and thereby suggests the remedy. The head of a large engine building establishment recently pointed out a discarded engine in the setting-up department which was in perfect order, and which eighteen years ago was a type of the best style of horizontal stationary engines then in use. When running it had a piston speed of 150 feet, and developed, by the indicator, about 100 H. P. Another engine of the same diameter of piston and same length of stroke, of the modern style, was running at a speed of 190 feet per minute, and yet was developing nearly 200 H. P. twice as much as the other. The reasons for this difference were several, that of 40 additional feet of piston speed per minute being only one. The modern engine had generous ports, both of ingress and ogress; the friction was, by careful balancing and exact workmanship, reduced to a minimum; all the trusts were exactly in line, with no canting leverage; and the journals, crank-pin, weight and length of connecting rod were all adapted one to the other and made for the work they were to do. Not a pound of superfluous metal, not a suggestion of a make-shift nor a faucy of a draughtsman could be found on the modern machine.

Another instance of the improvements that have been made in engine building and engine practice was noticed at the same establishment, where an engine of the modern type, 11 inches by 21 inches, was performing all the work that had been done until recently by an engine 18 inches by 36 inches that was built about seventeen years ago, and yet was not requiring two-thirds of the fuel used to furnish steam for the old-time engine running the same number of hours.—*Scientific American.*

A Talk About Belts.

Our natural tendency to deceive ourselves by preferring present convenience to future profit, says an exchange, is often too well illustrated in the selection and arrangement of belts. First cost should not determine the width and thickness of belts any more than it should determine their length. They should have width and thickness to do the work easily, without having to be strained so tight as to produce undue friction on the journals, and stretch the belts out of shape.

Having seen a small belt doing a great amount of work, we take that as the capacity of a belt of that size, under all circumstances, without noting the length of leverage it has over the load, or in other words, the great speed of the belt in proportion to the slow movement of the load; nor do we ask even of our own judgment how long a time such a small belt will carry such a heavy load without stretching into such crooks and curves as to destroy its future usefulness.

Double leather belts do not stretch into crooks and curves as soon as single belts do, because the soft, sponge-like places in each belt of the double one are frequently supported by the firmer part of its mate; also, double belts are not so often overloaded, and they get better care and attention.

A single belt will stretch crooked whenever a part of its width is softer than the remaining part, unless the load be adapted to the weaker part, just as the load of a chain must not exceed the strength of its weakest link.

In former times, when everybody made their own belts, men sometimes prided themselves on cutting up a side of leather so that the whole width of the belt would be of uniform texture, but their pride would often get a fall The worst belts that I have ever seen were home made. There are soft spots in the hide and in the leather, and they will be in the belt, sometimes across the entire width, but oftener only a part of the width. This makes unequal expansion, and unequal expansion will crook an iron plate. The manufactured article may possess uniformity, and it is better than the old style of home made belting, but good judgment would dictate ample width and high speed in proportion to the movement of the load for single belts.

Let any man look about him in mill or shop and he will see that it is not the heavy belts that men put up, with a full knowledge of what they had to do, that make the most trouble, but it is the single belts, such as men put up without much thinking about them.

BEARING METALS.—In the selection and final indorsement of a metal for journal bearings, says the *Journal of Railway Appliances*, a great many points should be considered that are too often disregarded. Durability, coolness in running, economy of oil, cheapness in first cost, etc., are all desiderata; but "one swallow does not make a summer," nor does one of these good points, though possessed in a startling degree, necessarily make a bearing metal superior to others. There are metals very popular on account of their great wearing qualities, which fairly eat oil, requiring a continual small deluge of lubricants, and often the adventitious aid of cooling compounds to prevent them from usurping the province of the car-heater. Others run cool enough, but are chewed up by the journal like an Ashantee in the mouth of a man-eater. The first cost of others would suggest the propriety of substituting cold, while others are useful only in demonstrating to what base use good type metal may be put. A bearing metal or alloy that will be economical of itself and lubricants, strong enough to resist the wear and tear of running, yet not so hard as to cut or file, that will not heat nor "crowd" (as some lined boxes are said to do), but which runs well and economically under all ordinary conditions, is something that has been most industriously sought for, but not yet found.

Iron Shutters a Failure.

Exactly what benefit iron shutters are, except to the party who makes them, is a question on which there are less doubts now than formerly. Public opinion is beginning to regard them as very useless, if not very dangerous, in most cases. They are among the worst obstacles firemen have to encounter when striving to enter a burning building. They prevent his ingress while they aid materially in protecting, and consequently developing, the fire till it has acquired a most dangerous violence. It is now regarded by the firemen as almost certain that where a fire has originated inside a building, sealed with iron shutters, it will destroy the building. In a recent instance, in New York, if the firemen had been able to throw water through the upper windows of that building when they first got to work they could have drowned the flames, but the iron shutters stood in their way, and they were compelled to follow the fire from the first floor until it reached the fourth, where it acquired such fury that the tons of water poured on it had for a long time very little effect. The idea that iron shutters keep fire out is a fallacy. Flames on the outside will heat them red hot, and they cannot be made so tight that tiny sparks may not pass them. Merchandise of the value of $2,000,000 were destroyed three years ago in a Brooklyn storage ware-house by a fire started by sparks from a fire-engine that was at work in front of the building, the sparks having passed through crevices at the hinges of a shutter.

STEEL nails have been made in this country in limited quantity for some time, but they have been held at figures so much above the price of iron nails that the trade developed but slowly. Now, however, they can be had at more reasonable figures, some companies selling at about the same price as iron nails, and their growth in popularity is rapid. The principal companies now making steel nails are the Riverside Iron Works, of West Virginia; the Bellaire Nail Works, of Ohio; Shoenberger & Co., of Pittsburg, and the Albany and Rensselaer Iron and Steel Company, of Troy, N. Y. The Tremont Nail Company and the Robinson Iron Company, of Massachusetts, also manufacture steel nails to some extent. The Benwood Iron Works, of West Virginia, will soon be added to this list, as its Bessemer steel plant is approaching completion. Other companies are making arrangements to manufacture steel nails, and some have done so experimentally, but if the demand assumes large proportions it is very likely that more active preparations will be made to meet it. The best steel nails now in the market present a very handsome appearance, being perfect in shape, with sharp edges, and not a flaw or seam visible, which is too often the case with iron nails. Some of the samples have been bent cold into a complete coil, demonstrating the toughness of the metal and its freedom from lamination.

A NEW HEAT MEASURER.—A paper on a new form of pyrometer, by T. Carnelly and T. Burton, was recently read before the Chemical Society. The pyromcter, which the authors have used since 1881, consists essentially of a copper coil that is placed in the muffle, kiln, etc., whose temperature is to be determined. Through this coil flows a constant current of water. The temperature of the water is taken as it enters the coil and as it flows out. From the difference of these two temperatures and a table, the temperature to which the coil has been exposed can be ascertained. By means of the above instrument, temperatures up to 650 degrees C. have been determined to within 25 degrees.

THE GILBERS SOAKING PIT PROCESS is now in continuous operation in four Bessemer works in England, two of which roll off directly without any furnacing whatever; and it is to be started at the largest open-hearth steel works in Scotland. On the continent two Bessemer works are using the soaking pit, a third one is just starting, and one open-hearth plant is also employing it.

SCIENTIFIC PROGRESS.

A New Telephone Transmitter.

Conversation Carried On a Distance of Twelve Hundred Miles.

The telephone has become such a necessary part of the business machinery of the world that any improvements tending to its more perfect operation are watched in their developments with interest. One of the great faults with telephones has been the induction between wires on different circuits near each other, by which persons talking over different lines could hear each other.

A few days since, according to the *Cincinnati Enquirer*, a test of a new transmitter was made over the wires of the Baltimore and Ohio Telegraph Company. An instrument was placed in the operating-room, and one in the cellar. These instruments were connected by a wire forming a circuit from the instrument in the operating room to Chillicothe and back to the instrument in the cellar. This made a distance of almost 200 miles. Over this length of line, the voice of a person talking could be heard very distinctly, even when spoken in so low a tone that another person standing a few feet from the person talking could not hear what was said. A line was next formed to Grafton, Va., 600 miles, and then to Baltimore, Md., a distance of 1,200 miles, and there was no perceptible change in the distinctness with which the voice could be heard or the words understood. It was a very severe test, yet it was demonstrated that with this transmitter, persons, hundreds of miles apart, can carry on conversations intelligibly. While the test was being made, the thirteen or fourteen telegraph wires were in operation, yet there was no apparent induction: the instruments could not be heard, as they can frequently be in this city, where the telephone and telegraph wires are near each other. This difficulty, it is claimed, is overcome by the formation of the carbons of the transmitter, so that there is air constantly between them, and when they vibrate while speaking into them the current is opened and closed perfectly, as with a telegraph instrument

Flame and Oxidation.

In the course of one of a series of lectures on "Flame and Oxidation" at the Royal Institution, Professor Dewar recently exhibited a machine for the manufacture of ozone on a large scale, constructed by Dr. Wise for use in a health resort under his charge in the Engadine. It had thirty-eight tinfoil plates, and the machine to drive the air through was a small turbine, there being plenty of water to drive turbines in Switzerland. By experiment he proved that platinum black would liberate iodine from iodide of starch, and that it did so by means of the air it carried down into the solution, because platinum black, freed from air by being taken from beneath water in which it had been boiled, had not the same effect. He next showed that the mere presence of platinum black and air would oxidize alcohol into acetic acid, and became greatly heated in the process. In another experiment he showed that the shaking up of granulated zinc with water in a partly filled large bottle would cause the formation of a small amount of peroxide of hydrogen; he further stated that a solution of peroxide of hydrogen in water, although perfectly colorless and transparent, has the power of cutting off the ultra violet rays of the spectrum.

Carbonic acid, he said, is the highest oxide of carbon, and the substances adhere to each other with such tenacity, that even the intense heat of burning magnesium can do but little in the way of separating the oxygen from the carbon, for when burning magnesium is plunged into carbonic acid gas it burns fitfully for a short time, and then goes out. Notwithstanding this strong affinity, the leaves of trees separate the carbon from carbonic acid under the influence of sunshine, but how they do so is not known; the oxygen thus separated does not appear to be oxonized. The red rays of the spectrum are most active in effecting the decomposition in the leaf, and the action of sunlight is clearly one of deoxidation. The carbon is not deposited in its pure state, otherwise it could not move about in the plant; it seems to be produced first in the form of sugar, which is afterward transformed into starch; or it may be that starch is formed first and sugar afterward. As starch can not move about in the plant, the inference is that sugar is formed first. In another experiment he showed that permanganate of potash—Condy's fluid—is deoxidized by the addition of peroxide of hydrogen, although both substances have strong oxidizing powers.—*Scientific American.*

A Curious Telephone Experiment.

Another very curious telephone experiment is reported as having been made at the April *seance* of the "Societe Francaise de Physique," at Paris. The experiment consisted of the use of a gloved hand as a telephone receiver. The apparatus used was a battery and a microphone transmitter in the main circuit, an induction coil with the break circuit closed, and two ordinary holders, such as are used when receiving a shock from a battery. When two people, each with one hand gloved, take hold of the two holders with their bare hands, and one of them holds his gloved hand over the ear of the other, any conversation or music near the microphone becomes audible to this other; or, if they hold one another's ears, both may hear. By leaning their heads together, so that their ears would touch except for a sheet of paper placed between them, the same result was obtained. It was also found possible to do away with the stretched membrane, the glove or paper, and for a third person to hear the conversation in the bare hands of the two holding the electrodes, when these two held their ears together. It has even been possible to render the sounds audible to a chain of people, each holding the ear of his neighbor.

The telegraph reports of July first report something still further new in this direction, which is given as follows: The new telegraph line which has just been opened between Boston and Providence introduces a new idea into the general telegraph business of the country. In the well known quadruplex system four messages may be sent at once over one wire, two in each direction. By the new system seventy-two messages may be sent at once over the same wire, all in one direction, or part one way and the rest the other.

The Late Earthquake in England.

The district where the shock of the recent earthquake was most severely felt in England, was confined to only one geological formation—namely, the middle Eocene, and to only one portion of that. This formation occurs in two districts. It reaches from London, in a triangular form, to the sea, from Shoeburyness to Aldborough, and it occurs again in Hampshire and the Isle of Wight. Essex and South Suffolk, which are the two counties where the shock was most felt, are one basin and bed of Loudon clay, which attains its maximum depth of about 500 feet in South Essex, near Southend. It is dangerous to theorize, but it may, we think, not unreasonably be suggested that the shock was not felt in Kent or in the adjacent districts, because the firmness of the chalk, extending to a great depth, resisted the subterraneous forces, whereas the London clay, which is a soft, gelatinous formation, was shaken from below through its whole thickness. To illustrate our meaning by a familiar illustration, the jelly on a supper-table will shake from a passing team when more solid viands remain unmoved. Any one who will turn to "Hull's Physical History of the British Isles," p. 3, and the map referred to, will find that Colchester, Ipswich, Malden, Southend, Shoeburyness, Bury St. Edmunds and all the town named in the dispatch are to be found on this one formation.

The number of shocks in an earthquake varies indefinitely, as does the length of intervals between them. Sometimes the whole earthquake only lasts a few seconds. Thus, the city of Caracas was destroyed in about half a minute, 10,000 lives being lost in that time. Lisbon was overthrown in five or six minutes; but a succession of shocks may continue for hours, days, weeks and months. The Calabrian earthquake, which began in February, 1783, lasted through a continued series of shocks for nearly four years, until the end of 1786. The area shaken by an earthquake varies with the intensity of the shock from a mere local tract, where a slight trembling has been experienced, up to such catastrophes as that of Lisbon, which convulsed not only the Portuguese coasts, but extended into Iceland on the one hand and into Africa on the other, agitated lakes, rivers and springs in Great Britain, and caused Loch Lomond to rise and to subside with startling suddenness.

UNDERGROUND TELEGRAPH WIRES.—The bulletin of the French Telephonic Society calls attention to a complete interruption on most of the telgraphic lines for 48 hours, caused by a violent tempest. The subterranean wires which united Paris with the principal cities of Northern and Eastern France worked, however, without interruption, so as not only to satisfy all their normal traffic, but also to supply much of the deficiency arising from the failure of the other lines. Had it not been for the underground wires, Paris would have been entirely cut off from all telegraphic communication with other points.—*Les Mondes.*

A LEGACY FOR AERIAL NAVIGATION EXPERIMENTS.—Charles F. Ritchel, of Bridgeport Conn., who tried to invent a flying machine, will get $100,000 to perfect the invention with from the estate of Maxwell, a millionaire brewer at Milwaukee, who left $500,000 for experiments in aerial navigation, one-fifth of it being specified as for Ritchel's machine. Ritchel will begin experiments on a large scale.

THE SUN'S ATMOSPHERE.—Ordinarily, what we see of the sun is the photosphere. But outside of that and beyond it the sun has an envelop of gas and streamers 200,000 miles in extent, and sometimes a 1,000,000 miles, and even 5,000,000 or 6,000,000 miles are thrown out. This invisible part becomes visible at times of eclipse.

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Passing Events.

The weather during the past week has been unusually warm for these latitudes, and San Franciscans are already sighing for their customary cool ocean breezes, which they usually profess to dislike.

The rumors of approach of cholera from abroad prove to be wrong; but extra precautions are being taken in New York and other Atlantic ports to prevent its getting a foothold in this country.

There is little news of special interest from the mining regions which we have not summarized in other columns. Prospectors are roaming the hills everywhere, and miners are all busy at work. They have had a strike at Bristol, Nev., among the furnace men. They wanted an increase of pay, which was refused. The men knocked off. Then, there being no furnace men to work the ore, the Mendha mine, Highland and Day mines, Royal City, had to stop and discharge their men and teams. The furnace hands received: Smelters, $4 per day; feeders, $3 50; and outside men, $3.

Business in the city is quite dull just at present. The interest of the country is just now centered in political matters, and this interest will probably increase until the November elections.

THE Morning Star Mining Company at Leadville paid a dividend of 25 cents per share or $25,000, on the 1st of July. This is the first dividend since November, 1883. In all the company has paid twenty dividends, amounting to $740,000.

Assessment Work and Relocations.

Some time since a man in Placer county, in this State, make an application for a patent for a mining claim, but before the patent was issued he died. Other parties then relocated the claim, and tried to keep it, but the man's heirs interfered, and the matter was brought before the Commissioner of the Land Office, and then appealed to the Secretary of the Interior. The men who had relocated protested against the patent being issued to the heirs, claiming they had a right to relocate the ground any time prior to issuance of the patent, because the annual labor to make requisite improvements on the mine had not been made by the man who applied for the patent or by his heirs.

This was only part of the controversy, but it is an important point, and one which miners will do well to bear in mind. The sole question, on this part of the subject, which the Secretary of the Interior was called upon to decide, was "whether such claim is subject to relocation by strangers, in the interim of entry and issuance of patent, even though the entryman may have failed to perform the annual labor or improvements required by Section 2324 of the Revised Statutes."

Section 2324, Revised Statutes, has reference solely to title by right of possession, and does not in any way conflict with titles acquired by purchase; for in the latter case both must be in one and the same person. The mining laws require certain acts, in the nature of conditions precedent, to be performed before an entry is made, and the validity of the entry is made to depend upon the facts existing at the time it is made, and not upon anything which the claimant may do, or omit to do, afterwards. * * *

"The true rule of the law governing entries of the public lands, to which mineral lands form no exception, is that when the contract of purchase is completed by the payment of the purchase money and the issuance of the patent certificate by the authorized agent of the government, the purchaser at once acquires a vested interest in the land, of which he cannot be subsequently deprived, if he has complied with the requirements of the law prior to entry; and the land thereupon ceases to be a part of the public domain, and is no longer subject to the operation of the laws governing the disposition of the public lands. In such cases there is a part performance of a contract of sale which entitles the purchaser to a specific performance of the whole contract without further action on his part. When the proofs are made, and the purchase money paid, the equitable title of the purchaser is complete, and the patent when issued is evidence of the regularity of the previous acts, and relates to the date of entry, to the exclusion of all intervening claims.

"In short, an entry made is, in all respects, equivalent to a patent issued, in so far as third parties are concerned.

"As the doctrine is firmly established, that where several concurrent acts are necessary to make conveyance, the original act shall be preferred, and all subsequent acts shall have relation to it, it is held that an entry made is equivalent to a patent issued, within the meaning and intent of section 2324 of the Revised Statutes."

"The right to a patent once vested is treated by the government, when dealing with the public lands, as *equivalent* to a *patent issued*. When, in fact, the patent does issue, it relates back to the inception of the right of the patentee, so far as it may be necessary to cut off intervening claimants."

Section 2324, R. S., contemplates that the prescribed amount of labor or improvements be performed and made annually upon each and every mining claim until patent shall be issued therefor; but it will be observed that such requirement is inapplicable to a case where the applicant has paid for and entered his claim, as has been done in the premises; inasmuch as the language of the section has reference merely to the right of possession—which is the very lowest grade of title known to the mining laws or any other law. The preliminary act of location is a basis for the vested possessory right, which is recognized by law, and of which the claimant cannot be dispossessed save upon the ground of absolute abandonment.

"Section 2324, the only statute affecting this question, must be construed in connection with Sec. 2325. Both have reference to the possessory title of an applicant for patent, and the mode of acquiring patent; the latter providing that, if no adverse claim is filed during the period of publication, it shall be assumed that none exists. It would, therefore, seem immaterial, after proceedings under Sec. 2325, whether or not the requirement of Sec. 2324 is complied with to the extent named in the first decision, because, if parties have not been properly notified, or have paid their share of the assessment work, they must still file their adverse claim under the proceedings contemplated in Sec. 2325. They waive their rights by failure to file such claim; and upon such failure, the law not only assumes that no such claim exists, but if the antecedent publication and attendant proceedings have been regular, all that might be set up by suit in court has been adjudicated in favor of the applicant."

"It was not a part of the public domain, being in the possession of the applicants for patent under at least a color of title. Whether they had complied with all the provisions of the law or not, there had been such a compliance that full and complete notice was given to protestants and all others, that the occupants thereof claimed to hold it under the laws provided for the acquirement of title to mineral lands. The law had fixed the time and method, by which parties disputing this claim might be heard, and they did not avail themselves of that provision."

The Drum Lummon Mine, Montana.

Through the courtesy of Geo. Attwood, Esq., General Manager of the Montana Co. (limited), of London, an English incorporation which recently purchased this mine, we are enabled to furnish our readers with a description of this valuable property, which bids fair to prove a bonanza second only to the celebrated mines of the Comstock.

The Drum Lummon is situated in Montana township, 21½ miles from Helena, its capital, and 13½ miles from the Northern Pacific Railroad at Bordsoy siding, at an elevation of 5,000 feet above the level of the sea. From its altitude and latitude the seasons are necessarily short, but with the advantage of water and timber in abundance and accessibility to rail, this disadvantage is but little felt. The mine was discovered and located by Thos. Cruz, an Irishman by birth, and sold to the present incumbent, he retaining a large stock interest in the property. Owing to decomposition of the gangue and its heavily mineralized contents, and the surrounding rocks being of a hard, crystalline character, the vein does not crop, but is largely covered by debris. Notwithstanding its extraordinary width, it is known as a blind ledge. The formation is a metamorphosed clay slate, or "*killas*," on the foot wall, with gray granite on the hanging. The gangue is quartz, its mineral contents a gray copper ore, or Fahlerz, containing an average of $35 per ton in gold and silver, in about the same proportions as the Comstock of Nevada, with a percentage of copper nickel and platinum. It varies in width from 52 to 150 feet, as proved by numerous crosscuts at various depths to a depth of 500 feet. A selection, however, if desired, from the mass, could be made of very much higher grade for a mill, as there are streaks that run as high as $700 per ton. But the Manager considers it more to the advantage of his company to work the mass as it is broken from the mine, without selection.

The vein courses on its line of strike north and south magnetic, and has been proved to carry ore for a distance of more than 2½ miles.

The mine is opened by an incline shaft, 12x8, which has attained a depth of 500 feet, with two main tunnels cross cutting the formation to and through the vein. The upper is 300 feet vertically from the surface, and is 400 feet in length.

The adit level is 1,200 feet in length. The vein is found at this point to be 52 feet in width, from which lateral drifts have been driven north 75 feet and south 54 feet, with stopes opened for the extraction of ore. The reserves are comparatively virgin and intact, as but very little ore has been extracted from this enormous mass. The mine will be timbered in the block or square set system.

A 30-stamp mill is now running at the mouth of the lower adit, by the dry process, crushing two tons to the stamp per day.

A new 50-stamp wet process mill is in process of construction. Its capacity will be from three to four tons to the stamp. When the latter is completed, the milling capacity will be over 200 tons per 24 hours. Steam is used as a motive power. The mills and mines are supplied with all the modern improvements for effectual speed and economical working of pans, settlers, rock breakers, self feeders and gravity for handling ores, wherever possible air compressors for hoisting, ventilation and drilling, a machine shop and saw mill for preparing timber and lumber. The mill and machinery was built by the Union Iron Works, of San Francisco, and it is estimated by Manager Attwood that the ores can be mined, milled and put into bullion, at a cost not to exceed eight dollars per ton.

Mr. Attwood reports the mining interests in Montana as in a very prosperous condition, and that the advent of the Northern Pacific R. R. has given a new impetus and life to this branch of industry. At Butte City, Haggin and Tevis mines are turning out large quantities of ore and bullion.

Adulteration of Tin.

At the last meeting of the California Academy of Sciences, Dr. Henry Gibbons, Sr., submitted for inspection some sheets of pure and adulterated tin such as is used for canning vegetables, etc. He suggested that probably cases of poisoning which had been reported, where people had eaten vegetables, fruit, etc., from tins, were due to the lead used with the tin to cheapen it. In some cases whole families were attacked with cholera morbus from this poisoning. Acids developed by fermentation, acting on the lead adulteration, take up arsenic and antimony. Salts of lead are all more or less poisonous, and produce colic. It has, unfortunately, become too common to adulterate pure tin with lead, to cheapen its cost in making cans.

Mr. Evans, a chemist, said there was no doubt about it. He had tested and analyzed asparagus juice, which contained a little tin and more lead; for lead mixes much easier, and a mixture of lead and tin also gives off tin easily, when pure tin alone would not be soluble. Our canning interests are far too important to be jeopardized by any such practices, and legislation should be invoked to protect our people, unless our Board of Trade and Chamber of Commerce can remedy the evil.

Mr. W. T. Garratt, of this city, had brought the subject to the attention of Dr. Gibbons, and suggested that the poisonous elements sometimes found were due to the lead with which the tin was adulterated, rather than to the tin itself. Tin is a metal somewhat expensive, and the lead is used to cheapen the tin sheets, used in making cans. Lead is used to coat the can first, and is acted on more readily by the acids than tin itself. Salts of tin are hard to form; but salts of lead are easier, and all more or less poisonous, some of them badly. Legislation should be invoked to prevent people making cans of this sort for the purposes of containing food substances. Society should be protected against this sort of adulteration. If iron is coated with pure tin, instead of tin and lead, there are no bad results. On comparing the sheets submitted, the difference was readily discernible to the eye. Those of pure tin were bright and lustrous; while the adulterated sheets are of a bluish tint and dullish in luster. As cans are usually covered with labels, the metal is not much seen, but the metal once seen can readily be distinguished.

Academy of Sciences.

The regular meeting of the Academy was held on Monday evening, Vice-President Harkness in the chair. A. Pierce was elected a life member, and Richard H. Sinton a resident member. Among donations to the Museum were several of peculiar interest. One was the seedless fruit of an egg-shaped plant from Guatemala, which grows there wild, and shows a marked affinity to a seed-bearing variety found only in Asia.

Dr. Behr stated that the plant found in Guatemala, being seedless, must have been propagated fully one thousand years from slips, to have become capable of a seedless reproduction. The fruit exhibited at the Academy was raised by Dr. Gustav Eisen, at Fresno, Cal., under glass. Dr. Behr thought its existence testified to a very ancient civilization in Central America, and an intercourse between Asia and America in very remote ages. A large block of volcanic pumice was received from Los Angeles, Cal., where large quantities drifted ashore about Jan. 8, 1884. Charles Walcott Brooks stated that as the drift of the current in the North Pacific Ocean was about 14 miles a day, it probably came from the eruption of Bogosloy, in Alaska, about October last, as the time was insufficient to bring it from Java; neither was it like the pumice emitted from Krakatoa in August last, nor like Hawaiian lava.

From Los Angeles come reports of a renewal of red skies before sunrise and after sunset. In many parts of the State a peculiar orange yellow covers the entire Eastern hemisphere an hour before sunrise, being especially bright along the horizon. This disappears at sunrise. Dr. Gibbons thought the whole upper heavens had been charged with vapor far above our atmosphere for six months past, and this may explain some of the extraordinary and unusual variations of the barometer lately noted.

The question of the use of adulterated tins or cans for fruit, etc., was discussed. This is referred to elsewhere in this number of the PRESS.

A Hand Grenade Fire Extinguisher.

Some time since mention was made in these columns of a new system of extinguishing incipient fires by the use of glass hand grenades. These grenades are made of glass, which, on being thrown into the fire, are broken and the contents liberated. Gases are immediately generated, which prevent the fire gaining headway. They have been rapidly introduced in the Eastern States, and are now being put into use in this city, where an agency has been established. The Harden hand grenade fire extinguisher consists of a glass globe filled with a chemical fluid, highly saturated with, and generating in fire-heat, an immense volume of fire-extinguishing gas, in which it is impossible for combustion to continue. The fluid itself is perfectly harmless to person or clothing. These grenades, when broken on a fire, discharge large quantities of fire extinguishing gas sufficient to cover a very broad surface of flame, and the action of the fire upon the fluid causes still further generation of the gas.

A public trial of these grenades was made at the Sand Lots on Thursday, before the Chief of the fire department, the fire patrol, and insurance and newspaper men. A wooden chimney was built, and the interior saturated with a mixture of coal oil and benzine. The flames shot up 20 feet, but one grenade thoroughly extinguished the fire. Then a structure of light wood, to represent walls of a room was built, and against the wall was placed a lot of loose, broken timber, and the whole saturated with benzine and coal tar. When lighted, an unusual blaze resulted. Several of the bottles or grenades were broken on the fire and it was speedily extinguished. The Chief Engineer of the fire department and the Captain of the fire patrol expressed themselves thoroughly satisfied with the results of the trial, considering the hand grenades very useful for extinguishing incipient fires.

The general rule to be always observed in using the grenade is this: Take quickest and surest method possible to break the grenade and scatter the contents on the fire. If the fire covers a hard flat surface, like the walls or floor of a room, throw the grenades against the surface of fire hard enough to break them and scatter their contents over the fire. If fires occur in a soft substance, like a pile of rags, hay or shavings, toss a few grenades into it, and break them by throwing other grenades against them. If simply thrown into the fire the heat will soon break them and smother the flame. If the fire can be approached close enough to do so, it is a quick and effective method of quenching it to take two of the grenades by the neck and break them violently against each other over the fire. These general directions will enable any one to master a fire of even larger extent by the use of a little common sense.

Among the merits claimed for this grenade by the makers are the following:

It is small and convenient for handling, can be hung up around every floor of the house office or factory, accessible at any instant's notice. Night watchmen can carry them in their pockets while making their regular rounds.

It is always ready for immediate use. They do not require an engineer to use them, nor a man to convey them. Any man, woman or child, capable of throwing a ball, can use them efficiently.

They are hermetically sealed, will keep for years in any climate. This is an improvement over any other fire extinguisher in existence. In other extinguishers the charge, to be effectual must be used soon or be replaced.

The fluid contained in them is perfectly harmless, and will not injure person or clothing.

These grenades are made to stand a temperature of 25 *degrees below zero*, by actual test.

A special recommendation is their cheapness. A dozen grenades can be furnished for about the same price as a dozen extra charges for ordinary extinguishers. No attention is required as the flask or grenade stands on a shelf or any convenient place ready for use at any time, and any servant girl will know enough to throw it into the fire. They will put out a coal oil, alcohol or benzine fire. A number of them can be distributed through a building ready for use at any point. There is no corrosion or wearing out, and there is nothing to get out of order.

In extinguishing fires with this appliance there is no damage except to the fire, as there is no drenching with water or eating of acids into carpets, furniture, etc.

The grenade is particularly adapted for places where the water supply is scant. In quartz mills, mines, etc., it will be specially useful.

It is the gas that extinguishes the fire, and not the liquid. The contents of the grenade are harmless to persons or clothing. The fire extinguishing gas of the grenade is generated by heat. When a grenade is broken into fire the entire contents vaporize into the gas, filling a large space, within which it is impossible for fire to live. The gas is generated in the fire itself, where it is wanted, and there is no waste. This gives a large volume. One grenade after another can be broken in the fire if it has good headway. If a flue is on fire, a grenade broken in the stove will extinguish the fire to the top of the chimney. These grenades will not explode until subjected to a heat of over 200 degrees, which is a very valuable feature and makes them automatic. They can be placed in the holds of ships, in garrets and other out of the way places where fires are likely to occur, and will act themselves when there is sufficient heat. Public tests and trials of these machines have

HAND GRENADE FIRE EXTINGUISHER.

been made in many cities. The chiefs of fire departments in large cities have endorsed them, and hundreds of large establishments have adopted the system. The flask or grenade is of colored glass, and somewhat ornamental in appearance. An engraving of one is shown on this page. Mr. H. H. Gross is the agent for this coast, No. 21 New Montgomery street.

THE BIG MINING SUIT.—A dispatch from Eureka, Nev., dated the 8th, says: After two days' argument before Judge Rives, of the District Court here, he this afternoon virtually denied the motion to continue the suit of the Albion vs. the Richmond for a half-million dollars damages, conditional upon stipulations to be made by a meeting of the Court to-morrow morning. Great interest is manifested here, as, on account of the suit, the Richmond has closed down the mine furnaces and refinery, thereby throwing out of employment a large number of laborers. Hon. Thomas Wren, assisted by A. E. Cheney, is counsel for the Richmond, and Hon. William Stewart, W. S. Wood and Baker & Wines are counsel for the Albion. The motion for continuance was made, on the ground that the same issues were now pending in the United States Supreme Court.

MANUFACTURERS' ASSOCIATION.—The Manufacturers' Association on Monday held a meeting, when Holbrook, Merrill & Stetson, the Giant Powder Co., the Standard Sugar Refinery, the Continental Oil and Transportation Co., Waterhouse & Lester and I. W. Taber were elected to membership. The question of Mexican trade was discussed, the members seeming to think that St. Louis was getting ahead of San Francisco in that regard. The Secretary was authorized to open and maintain a branch office of the Association at the Mechanics' Pavilion during the continuance of the fair.

Mill Sites.

Some time since, Mr. J. B. Haggin, of this city, made application at the Land Office of his mineral entry for the Mariposa quartz mine, and mill sites Nos. 1 and 2, Coso district, Inyo county. Payment was made, and final certificates issued to Mr. Haggin. One mill site contained 4.50 acres, and the other (0.50) one half an acre. The Commissioner of the Land Office decided that the U. S. Statutes, and the regulations of the Land Office did not contemplate that more than one mill site or tract of land for milling purposes may be embraced in an application for patent for a lode claim, and therefore directed the cancellation of one of the mill site tracts. From this decision, Mr Haggin appealed to the Secretary of the Interior. The question for him to decide was whether, keeping within the restriction of five acres of non mineral land, more than one mill site could be embraced in the application for a vein, and patented therewith.

In his decision, the Commissioner called attention to the clause in Section 2,337 R. S., which provides "that the owner of a quartz mill may also receive a patent for his *mill site*, as provided for in the Section," and to that part of the Section which provides for holding "a *piece* of non-mineral land" for milling purposes. The construction of the law by the Commissioner showed that he based his decision on the ground that in said Section the singular number only is used. If there were any force in that view, in general rules of construction, it would not avail here, because the fourth Section of the Revised Statutes provides that "words importing the singular number may extend and be applied to general persons or things; words importing the plural may include the singular." The regulation, therefore, which follows the statute, should, in that respect, be construed in like manner as the statute.

The Secretary of the Interior reverses the decision of the Land Commissioner, and says in his opinion, Section 2337 does not require that construction placed upon it; and since the amount in both locations does not exceed five acres, he thinks in this instance both mill sites should be permitted to stand. He adds that in both instances it might be necessary for the owner of the lode to use or occupy only one piece of non-adjacent surface ground, and in other instances more than one piece might be necessary and proper. He thinks the practice under said section should be to allow the entry of such number of pieces as may appear to be necessary for mining and milling purposes.

THE SMALL HOPES CONSOLIDATED MINING Company of Colorado paid a dividend of thirty cents per share, or $75,000, on the 19th of June. This is the sixth dividend, and the total is $262,500.

Gold and Silver.

The annual clean-up and settlement at the San Francisco mint was commenced a few weeks ago. The coinage for June was $1,180,000 in $20 pieces, and $300,000 in silver dollars. The coinage for the fiscal year ending June 30, 1884, was as follows:

Double Eagles		160,000
Eagles		152,500
Half Eagles		651,000
Total Gold		$ 5,043,500
Standard Dollars	$4,800,000	
Dimes	50,000	
Total Silver	$4,850,000	1,850,000
Total Gold and Silver		$ 6,893,500

In addition the mint executed an order for $1,000,000 in silver coin for the Hawaiian Government between the 1st of November, 1883, and the 1st of June, 1884.

Over $1,000,000 in gold coin and bullion was shipped from here in June. Of this $776,981 went to Hong Kong; $137,000 to Yokohama; $75,000 to Honolulu; $2,500 to Gambier Island; and $33,650 to New York.

The treasure shipped from this city through mercantile channels for the first six months of the year was $6,582,805, of which $2,835,669 was in Mexican dollars; $2,376,034 in silver bars; $470,075 in gold coin. In addition to this there were shipments of $880,800 by registered mail, making in all $7,463,605.

A short time since we published an account of the immense stock of gold and silver at the Sub-treasury in this city. The cash balance in the treasury here on July 1st, was as follows:

Gold coin	$49,373,000
Standard Dollars	18,010,000
Fractional Silver coin	7,799,711
Nickels	19,600
Paper money	7,670,000
Total	$82,872,311

The gain in gold coin for the month of June was $1,371,000. As there was only $1,180,000 coined at the local mint in June, and as there was $63,295 sent to Hongkong and New York, there was a net loss to local circulation of $254,295 in gold coin in June. Treasurer Spaulding has withdrawn nearly $10,000,000 in gold coin from local channels of circulation in the last six months. As only $8,747,500 has been furnished to the local mint in the past six months, and as $1,350,825 has been sent out of the State in the same interval and $9,910,000 has gone into Government vaults, it follows that there is $2,513,325 less in circulation than on January 1, 1884

THE CUMMER ENGINE CO. have shipped another one of their Ballantine ice and refrigerating machines recently to the Robert Portner Brewing Co., Alexandria, Va., and will shortly ship two more of these machines to the Buffalo Co-operative Brewing Co., Buffalo, N. Y. The refrigerating machine recently shipped by the Cummer Co. to Albert Ziegele & Co., of Buffalo, has been started up with great success, and the purchasers are much pleased with its performance. The Cummer Engine Co. have just furnished a 225 H. P. engine to the Amoskeag Manufacturing Co., of Manchester, N. H., and will in a few days ship a 67 H. P. engine to Messrs. Stules & Kile, of Orwell, O. The following orders have just been placed with the Cummer Engine Co.: A 55 H. P. engine, with complete outfit, for Messrs. Todd & Hosford, Eugene, Ind.; one of 35 H. P. for Carlton, Foster & Co., Oshkosh, Wis.; and a 55 H. P. outfit, complete, for A. Dietly & Son, Moorheadville, Pennsylvania.

RIVERS AND HARBORS.—Among the appropriations by Congress, in the total of $13,609,200 for improvement of rivers and harbors, are the following items: Humboldt bay, Cal., $62,000; Oakland harbor, $139,600; Wilmington, $50,000; Coos bay, Oregon, $30,000; Yaquina bay, Or., $50,000; Sacramento and Feather rivers, Cal., $40,000; San Joaquin river and Stockton and Mormon sloughs, California, $20,000; Colorado river in Nevada, California and Arizona, $25,000; month of the Colorado river, $100,000; Columbia river at Cascades, Oregon, $150,000; Columbia and Lower Willamette, below Portland, Oregon, $100,000; Upper Columbia and Snake, $20,000.

CENTRAL PACIFIC ANNUAL ELECTION.—The annual election of Directors of the Central Pacific Railroad Company was held yesterday at the office, Fourth and Townsend streets. About 20 persons were present, the voting being almost entirely by proxy, and out of the 590,000 shares, 420,000 were voted, the result being in favor of the old Board: Leland Stanford, C. P. Huntington, Charles Crocker, C. F. Crocker, Timothy Hopkins, W. V. Huntington, E. H. Miller, Jr.

English vs. American Policy.

England, despairing of holding her own in the cotton markets of the world, is resorting to the desperate policy of transferring a large portion of that industry to India, where she hopes to utilize the cheap labor of her two hundred and fifty millions of serfs, who are glad to give a day's work for ten cents and count fifteen hours to the day. Although this movement is only in its infancy, still her capitalists have already upwards of seventy cotton factories now in operation there, with about 19,000 looms.

This experiment is a most dangerous and demoralizing one, as is already becoming apparent to the intelligent and thoughtful English statesman. England originally planted herself in India with the expectation of founding there, or rather of building up in that region, a large market for her home productions, and incidentally securing the control of certain products, under her own rule, for which she would otherwise have to depend upon foreign and more or less hostile nations. But scarcely have the people of that region been educated up to see and feel the ordinary wants of civilization before her capitalists engage in the work of putting into the minds and hands of those people the intelligence, skill and tools to supply themselves with their new-found needs. England did not do so with her American colonies. Perhaps they taught her a lesson in that direction which she does not care to have repeated. The policy may be all right, ethically considered, but its damaging effect upon the English people will be all the same, and its demoralizing tendency upon the masses will be none the less for the moral and civilizing aspect which it assumes.

In fact the movement has already become a disturbing element, not only among the masses at home, but also among the capitalists there who have invested their means with the view of giving employment to their own people and seeking a market for the products of their labor in India. Notwithstanding the consumption of cotton goods is rapidly increasing in India, their importation from Great Britain is falling off. Within the last three years the falling off has been about 10 per cent. And what is still more significant, India is already entering foreign markets with her manufactures in direct competition with the United Kingdom. Indian statistics show that the importation of piece goods from India to China rose from 15,000,000 yards in 1880 to upwards of 41,000,000 in 1883! Moreover, hitherto the bulk of the Indian trade in general has been largely with the United Kingdom, but now the complaint comes up that that too is falling off. Carefully prepared statistics show that the total amount of decrease in this direction from 1877 to 1882 reaches within a small fraction of 10 per cent!

The fact elsewhere noted in these columns, that of the 40,000,000 spindles which represent the cotton manufacturing industry of this date in England, at least 20,000,000 are running at a loss, 2,000,000 are idle, and only eight out of the 18,000,000 remaining are holding their own, speaks volumes to the thoughtful statesman as to what the near future may bring forth.

And it is not in the cotton industry alone that India looms up as a future rival to the home Government. She shows very nearly a similar development in the jute fabric; also in the manufacture of boots and shoes. Coal, iron, steel, paper and leather are also being produced. Raw cotton is also being largely produced there, while her production of wheat is getting to be enormous, and has already seriously affected the market for American wheat among the buyers of Europe. In these two latter cases, England may be the gainer, and the United States the loser.

But taking the aggregate, England, by her own act, is brought into direct competition with the cheap labor of India—the cheapest labor in the world. That step is already telling with fearful effect upon her idle, starving masses at home. What will they do about it? But one way seems open to them—emigration to this country, where the true policy of home protection prevails. We have a country large enough and broad enough for all the intelligent, skillful, but down-trodden masses of Europe—large enough to give them all a farm. We have no entangling alliances abroad; but we do not seek either to control or incorporate into our body politic the ignorant, half civilized people, who may be found either upon our outlying borders, or in more distant regions. We are willing to extend to all such, a kindly, helping hand. We would do what we reasonably can to raise them to the level of civilized humanity, and look for our reward simply in the satisfaction of serving a neighbor and accepting the incidental and greater benefit that would naturally accrue from contact with an industrious and civilized people, over a half civilized, ignorant and idle people.

We have adopted the policy of keeping out from our borders all objectionable classes. We want none but such as can assimilate with us. We have already put up the bars against Asiatic half civilization, and we are now engaged in strengthening them. We have a similar work to do with the ignorant pauper labor of other parts of the world. That work will soon be done. But we welcome with open arms, intelligent and skilled labor, such as comes to us in good faith, to accept our policy of protecting ourselves; to sustain a free and popular form of government, to establish and encourage the family relation and the christian form of marriage. Such people always come with something wherewith to help themselves. They make good citizens, good neighbors, good commonwealth builders. We have room for all such. We bid them welcome—welcome to our broad acres, welcome to our shops, and welcome to all the relations of life and business.

The policy we have adopted is self sustaining. With a land, stretching from the northern Arctic to the southern tropics, we can produce everything we need, and live comfortably and respectably while we produce it, and we don't propose to allow the pauper, or serf labor of outside nations to interfere with our internal relations. We propose to raise our own food, our own raiment, our own luxuries, our own circulating medium, and everything we need or want, and to allow the producer such a fair compensation for his labor, as will enable him, and his family, to live as an intelligent civilized man should live.

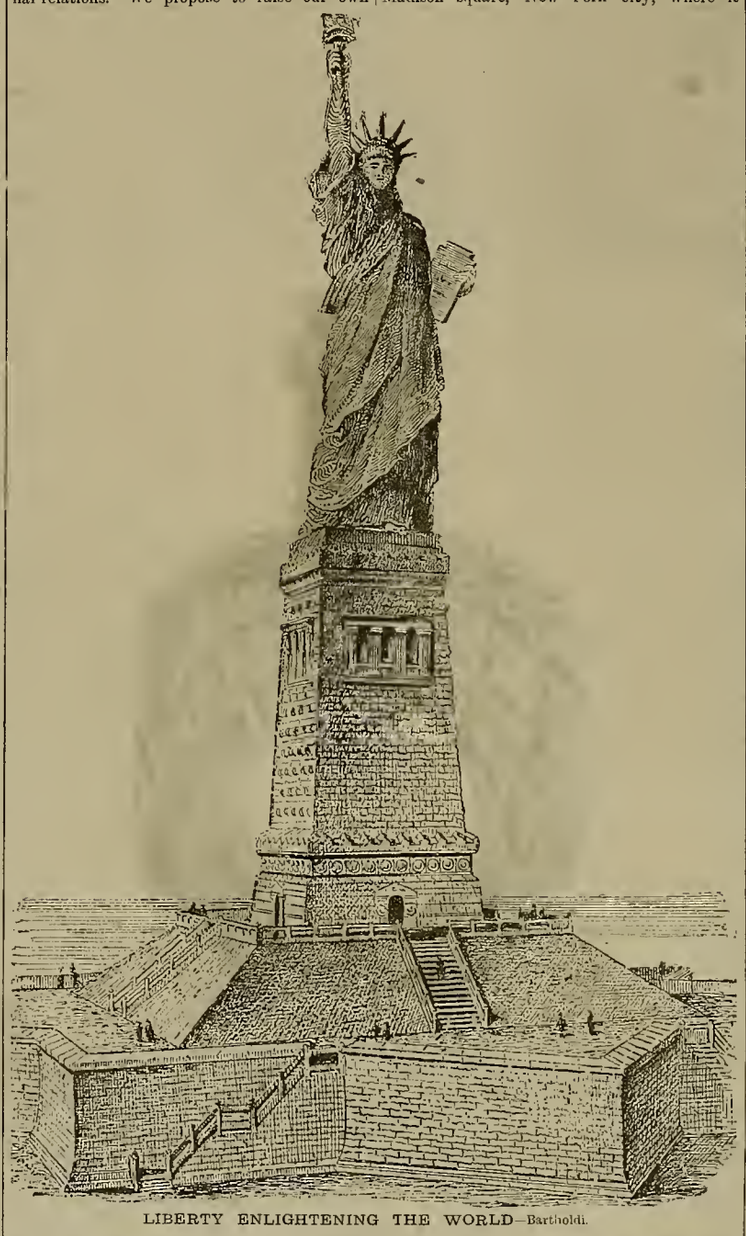
We have within our own limits, the best market on earth, and we propose to hold it against all countries. Our people stand unrivalled in education, in mechanical skill, in productive power, and in mercantile aptitude. Our country is without a rival in the variety, or quality of its productiveness. There is no country on the globe, that can come nearer to absolute independence of all others than our own. We can provide our own markets, and when we have a surplus, we have the markets of the world to chose from. Our cereals, our staples, our fruits, our manufactured goods of every class have no superior, anywhere, and our skilled and intelligent labor aided by the best mechanical appliances is, as a general thing, able to cope with the cheap labor, and less skillful appliances of all competitors. When the need comes, we can enter all the great markets of the world.

We now number but 50,000,000 of people; but we have room enough for five or six times that number. And when our present limits are full, and we need more room, we shall know where, and how to get it—the whole boundless continent, may be ours from the northern to the southern Arctic.

Bartholdi's Great Statue of Liberty.

We give herewith an engraving of the famous statue of "Liberty Enlightening the World," designed by Bartholdi and presented by France to the people of the United States. The money was raised by popular subscription in France, and the funds were all subscribed in 1880 and the work of casting the bronze begun forthwith. Since that time the work has progressed to completion, and the raising of funds in this country to provide for the pedestal and for the erection of the statue has been under way.

The huge torch-bearing hand of the figure was made first, and was exhibited at the Centennial in 1876. After that it was taken to Madison square, New York city, where it waited for years the coming of the other members from France. It is impossible to give any adequate idea of the imposing magnitude of this figure from an engraving. Beside it, the collossus of Rhodes, the boldest achievement of ancient art, would appear but as a child.



LIBERTY ENLIGHTENING THE WORLD—Bartholdi.

It is the intention to set the statue at the entrance to New York harbor, on Bedloes island. Facing the sea, the statue will serve the double purpose of a light tower for the guidance of incoming ships and a type of the grandeur of the New World, in its physical features and its political institutions and influence. Bedloes island is small, yet ample for the intended purpose. It will furnish a base for the statue, perhaps twenty feet or so above the water. On this will rest the pedestal 110 feet high. The statue to the flame of the torch in the uplifted right hand is 145 feet high. This will make the light at least 275 feet above the level of New York bay, making it visible many miles at sea. The statue is cast in bronze, in pieces of manageable size, to be rivited together when erected upon its permanent site.

Mr. Bartholdi is an Alsatian by birth and has achieved an enviable fame as a sculptor, several of his works being of gigantic size. After the Franco-Prussian war he spent several months traveling in this country. Subsequently he was chosen by the French government to prepare a suitable testimonial for the sympathy and diplomatic service rendered by the United States during the investment of Paris, and the result, a statue of Lafayette, now graces Union Square, in New York city.

As an American undertaking, a colossal statue of this kind and for the purpose stated might seem unbecomingly ambitious, not to say bombastic, but as a gift from a friendly and appreciative republic across the sea its design and purpose cannot be misconstrued.

The exhibition of this great work in our columns we deem especially appropriate to the occasion of the National Holiday. The idea expressed in the commanding figure in the engraving is the same in essence as that which was declared July 4, 1776, and which is the mainspring of our great success and progress as a nation.

Padre Junipero Serra.

The following address has been issued to the people of California, and signed by Gov. Stoneman and about fifty of the most influential citizens of the State:

On the 28th of August, next, California will commemorate the one hundredth anniversary of the death of her first pioneer, the founder of Indian missions, Padre Junipero Serra. After a long life of sufferings, sacrifices and hard labor, in the service of his beloved Indian flocks, this venerable priest yielded up his spirit to God, and his body was laid at rest under the stone flags of the old church of San Carlos, in Carmelo valley, the scene of his labors and death. The Mission of San Carlos, first established at Monterey on the 3d of June, 1770, and removed to Carmelo in December of the same year, was the second mission founded in Upper California by Father Serra, President of the Franciscan Missions. Of the twenty-one missions established in California a few are well preserved, others are in ruins, and of some not a vestige is left to mark the spot where they once stood. The most picturesque and poetic of these historic landmarks of our State, and the noblest work of Padre Serra, is the old stone church of San Carlos at Carmelo, and it is a sad spectacle and a reproach to California to see this venerable pile, through neglect and apathy, slowly crumbling into dust. Inexorable time has laid his finger on this relic of religion and civilization, and leveling it to earth, until, quite recently, the Rev. Angelo D. Casanova, the pastor of Monterey, undertook to stop the work of destruction and preserve to California this monument of the life and labors of the venerable Padre Serra and his last resting place, and also that of some of his co-laborers in the missions, and a few of the early Governors of California. The restoration of the old church is going on. Already $4,000 has been expended on it, and the total cost is estimated at about $15,000.

It is hoped that the work will be completed by the 28th of August next, and the centennial anniversary of the death of the energetic pioneer will see his work as it stood when his body was laid under the flags. We now make an appeal to the people of California, irrespective of creed, to pay a tribute of respect to the memory of this venerable man by assisting with their means in the restoration of the old stone pile, that it may stand, through coming ages, a monument over the grave of one whom we revere, respect and love.

We ask Californians to help this undertaking by forming committees in every town, and forward their collections to Father Casanova, at Monterey, that this building, one of the first fruits of civilization in our beloved State, may be restored, and the centennial anniversary of Junipero Serra's death commemorated in a manner worthy of the good pioneer priest.

MACHINERY has done much in America in cheapening the cost of agricultural products, but the limit of efficiency in that direction has by no means been reached. The vast prairies of the West would seem to be specially adapted by their level surface to the operation of steam plows, yet thus far but little progress has been made in the substitution of steam for horses. Experiments have been frequently made of a favorable nature. Last week at Fargo, Dak., a traction engine drew eight plows, turning a sod four inches thick as evenly and well as could be done by horse-power, and at a rate of over 25 acres a day. As the cost of steam plowing is rated at about $1 per acre by these experimenters, as against $3 by horse-power, the adoption of steam plowing ought to proceed rapidly, and we know of no place in the world where it ought to prove more successful than in California.

AMERICA'S GROWING IMPORTANCE.—The United States, great and important as she now is, has a much greater and more magnificent future before her. But a little over a century old, she must soon become the largest and most influential nation on the globe. Foreigners are already beginning to appreciate her present and growing importance. A French paper recently said: "A hundred years ago America was almost nothing, fifty years ago it began to be something, now it amounts to a great deal, and there is every reason to fear that in fifty years it will be almost everything."

SPOKE MACHINERY.—Manufacturers and dealers in spoke machinery report an unusually large demand for this class of machinery, especially from the Southern and Southwestern States.

ENGINEERING NOTES.

The Nicaragua Canal Project.

If the Government is to secure possession of any canal highway between the Atlantic and Pacific there is no question that the Nicaragua route is in every way the most desirable one for American interests. As compared with the Panama or French route it is claimed to be far superior. The French have been at work already nearly three years, and have expended almost as much money as was contemplated in their first estimate, and yet the work is hardly commenced. The climatic conditions in that locality, the enormous depths of the cuts, in some places 600 feet, in soft, sliding earth; the danger that such slopes cannot stand the sudden and tremendous falls of rain, the turbulence of the Chagres river, which sometimes rises sixty feet in twenty four hours, the unhealthiness of the region, and the certainty that the route, even if it is finished, will be worthless as soon as another is made further north, are obstacles that cannot be overcome.

The Nicaragua route, on the other hand, as Lieut. Maury long ago predicted, was designed by Nature as a route for interoceanic transit. It has the advantage of 120 miles of water navigation. The greatest depth of cuts would be 101 feet, the average less than 61 feet. It would command the major part of the commerce of the Pacific, as it is several hundred miles nearer our Atlantic and Pacific ports, as well as China and Japan, for the carrying trade. It passes through a fertile, healthy country waiting to be developed, and its cost is estimated at a comparatively small sum, ranging between $50,000,000 and $65,000,000, an amount which has already been expended by the French company, counting the sum paid for the Panama railroad, with nothing of importance to show for it. The Nicaragua canal when completed will be an American canal that will speedily end the pretensions of the French affair at Panama, and, whether upon commercial or national grounds, there is no good reason why our Government should not possess itself of the advantages which lie in its way by securing and controlling this route of interoceanic transit.

That the Government is in earnest in making this an essentially American route we have sufficient evidence in the fact that the Senate in a recent secret session discussed the the propriety of appropriating $250,000 to secure certain supplemental concessions from the Government of Nicaragua, the nature of which is to secure to the United States the absolute right of way between the Atlantic and Pacific along the route of the projected Nicaragua canal, and thus exclude foreign powers from securing the advantage. With the exception of these, the Senate is unanimous in favor of the appropriation, and as the House Committee on Foreign Affairs has expressed itself in favor of the appropriation also, it is probable that the House will vote its approval when the matter comes before it.

It is more than probable that in the end there will be three ship routes across this narrow portion of the continent: The French at Panama; the English at Tehauntepec by Ead's ship railway, and the American *via* Nicaragua.

THE EADS SHIP RAILWAY.—The new models of the carriage and pontoons of the Eads Ship Railway have started for London. Nearly all the capital for the enterprise is being subscribed in that city. Chief Engineer Corthell says 100 men are at work, and that the first half mile of track has been completed. This, with the river course, which admits three of the largest ships abreast, completes 25½ miles of the Tehuantepec route. The new pontoon system of raising vessels from the water upon the railway carriages is to be substituted for the hydraulic system first contemplated. It was conceived by London engineers and adopted by Eads, and will raise a ship out of water and upon the carriage in 20 minutes.

THE MANCHESTER (ENG.) SHIP CANAL.—The Manchester Ship Canal Bill passed the House of Lords May 23d, conditionally that the work should not be commenced until $25,000,000 of capital was subscribed and issued, and that must be done within three years. Manchester has often surprised the world by its enterprise and energy, and in the whole inception of this canal scheme (which proposes to allow of ocean-going ships reaching the city without unloading at Liverpool), so far as it has yet gone, has proved that those great qualities are as fresh and vigorous as ever. The opinion is confidently expressed that the needed capital will be subscribed for within the time specified.

THE PANAMA CANAL.—It is affirmed that of 90,000,000 cubic metres of earth which have to be excavated from the Panama canal, only 2,500,000 cubic metres had been removed up to October, 1883. In that month more than 10,000 men were employed on the work. It is now proposed to increase the working force to 15,000 men, and it is expected that with better weather the extraction will be materially increased.

THE decrease of the public debt during June was $9,217,256, and the decrease since June 30, 1883, $101,040,971; cash in treasury, $391,985,928; gold certificates, $98,392,660; silver certificates, $119,811,691; certificates of deposit, $12,385,000; refunding certificates, $290,000; legal tenders, $346,681,016; fractional currency, $6,980,061; available cash, $139,887,449.

USEFUL INFORMATION.

Chewing the Cud.

Every child living in the country has stood and watched this curious operation, and wondered what the lump was which he saw come up in the cow's throat, and then go down again after she had chewed it for a certain length of time. And perhaps he may have seen the anxiety and turmoil produced on a farm by the report that some one of the cows had "lost her end," and as the result of this excitement he may have seen the absurd attempt to "make a new end," in the hope that the cow would by such means be restored to good condition. There is in the minds of a large proportion of our readers so little correct understanding of the true nature of "chewing the cud" that a few words concerning it may not be amiss.

A very large tribe of animals, of which sheep and cows are only familiar examples, are called in works of natural history *Ruminantia*, because they *ruminate*, they chew the cud. They do so because their peculiar organs of digestion require it; they can get their nourishment in no other way. They have, it is said in the books, four stomachs, but the statement is not strictly correct, for the entire digestion is done in a single one—that which is called the fourth—the other three being only places for preparatory work. Their food is swallowed without being chewed; the chewing is to come later. When this unchewed food is swallowed it passes directly into the first stomach, to use the common term; but the drink which the animal takes goes straight past the entrance of the first into the second. These two serve only to *soak* and soften the coarse food. When the first has done what it can, the food passes out of it into the second, and then the cow or sheep is ready to "chew the cud."

The second stomach, while busily at work in soaking the food, keeps it in motion, and gradually rolls it up into masses, so that in the small upper part there is formed an oblong solid lump of the size that we recognize as the "cud." This the animal throws up into the mouth, and chews with evidently as much satisfaction as the same act of mastication gives us when we put the most delicate morsels between our teeth. When it is sufficiently chewed, the mass is swallowed and its place taken by another which had been rolled up in the meantime.

But the "cud" thus masticated does not return to the second stomach, from which it had come. It passes smoothly into the third, a place for additional lubrication, and then into the fourth, where the true digestion begins and ends.

This is, in brief, the whole story, and we see how naturally the chewing comes in. It is the same as in our own case, only that it is at a different stage of the food's progress. And we see also what "losing the cud" really is. The cow or sheep is suffering from indigestion; the "second stomach" has failed to roll up the little masses suitable for chewing, and there is nothing which the poor beast can bring up. Of course, therefore, the one thing required is to *restore the tone and power of the stomach;* not to burden it with an "artificial end," which would only increase the difficulty, instead of relieving it.—*Scientific American.*

GLUCOSE IN LEATHER.—According to the *Shoe and Leather Review*, the falsification of the weight of leather by adding glucose, or grape sugar, appears to be carried on extensively in Germany, and the shoe trade societies are taking steps to protect themselves from the imposition. A simple test is recommended, which consists in placing pieces of the leather in water for the space of 24 hours, when the glucose will be dissolved by the water, and the result will be a thick, sirupy liquid. When two pieces of the leather are placed together and left in that position for a time, it will be found difficult to separate them, as the gummy exudations will stick them together. It is stated that some samples of sole leather were found to contain as high as 30 to 40 per cent. of extra weight. Another test recommended is to cut off small pieces of the leather, and, wrapping them up in a damp cloth, lay them away for a few days in a temperate place. If the leather is adulterated, the pieces will be found to be stuck together, and surrounded by a sirupy substance in proportion to the quantity of the adulterant used; and the peculiarity about leather treated with grape sugar is that, after wetting, it is difficult to dry, and resembles gutta percha or untanned leather more than the genuine article.

HOW TO GET RID OF RATS.—The following method has already been suggested, but the experience of the person hereio alluded to may be of service to some who have not tried the the remedy: He caught a couple of large rats in a trap alive, and then besmeared them all over, except their heads, with tar, and let them loose in their favorite run. But he says: "I could not follow these two tar-besmeared rats into their numerous runs to see what would happen; but it is reasonable to assume that they either summoned together all the members of their community, and by their crestfallen appearance gave their comrades silent indications of the misfortunes which had so suddenly befallen them, or that they frightened their brethren away, for they, one and all, forsook the place and fled. The experiment was eminently successful. From that day, in 1875, till now, 1883, my house, ancient though it is, has been entirely free from rats, and I believe that there is no remedy equal to this one."

PAPER HANGER'S PASTE.—Beat up 4 pounds of good white flour in cold water—enough to form a stiff batter—sifting the flour first, and beat it well to take out all the lumps. Then add about 2 ounces of well powdered alum. Have a quantity of boiling water at hand, and pour it gently and quickly over the batter, stirring it rapidly at the same time; and when it is observed to swell and lose the white color of the flour it is cooked and finished. It is recommended not to use it while hot, as when cool it adheres better and goes further. A little cold water poured over the top will prevent the formation of a skin. When about to use, a small additional quantity of cold water should be added, so that the paste will spread easily and quickly under the brush. In warm weather it cannot be kept for many days without fermenting, when it becomes thin and useless. To avoid this, a few drops of carbolic acid added to the mass when it is prepared, will enable it to be kept almost indefinitely.

LUMINOUS PAINT is fast coming into quite general use. It will soon be used for painting door casings and the woodwork of hallways, so that persons may be able to readily find their way about the house in the dark. Railway carriages may be made to glow softly within and without. Gate posts might be made to show themselves more readily than now. In time the outside of buildings might be thus made to make themselves luminous during the night by the light which they have stored up by day. Numerous other uses have already been made of this interesting discovery, and others will readily suggest themselves. The uses to which this paint may be put multiply themselves rapidly as we dwell upon the theme, and will be largely utilized as soon as it can be placed on the market at a moderate cost.

MR. EDISON is a philosopher, as well as a being gifted in other ways. The remark made by him to the effect that "it requires just as much ingenuity to make money out of an invention as to make the invention," will do for him to base a claim on for such honors. The truth of that statement is apparent and is exemplified by Mr. Edison's career. In that he is able to draw this lesson from it, he is a philosopher.

A CHEAP INSECT DESTROYER.—A correspondent of the *Fruit Recorder* says he has boiled leaves and stems of tomato plants until the juice is all extracted, and finds the liquor deadly to caterpillars, lice, and many other enemies of vegetation. It does not injure the growth of plants, and its odor remains for a long time to disgust insect marauders.

GOOD HEALTH.

Suicide and Sleeplessness.

The circumstances attending the recent death of the Dean of Bangor—albeit they are infinitely distressing—present no novel features. The reverend gentleman, according to the *Lancet*, was a man of considerable intellectual "power," which is the same thing as saying that he was constitutionally liable to intervals of mental depression. All highly intellectual men are exposed to this evil. A pendulum will always swing just as far in one direction as it does in the other. Great power of mind implies also great weakness under certain conditions. The marvel is not that great minds occasionally become deranged, but that they so often escape derangement. Sleeplessness means not merely unrest, but starvation of the cerebrum. The brain cannot recuperate, or, in other words, it cannot rest. Physiologically, recuperation and rest are the same thing. Sleep is simply physiological rest. The only cause for regret in these cases is that the blunder should ever be committed of supposing that a stupefying drug, which throws the brain into a condition that mimics and burlesques sleep can do good. It is deceptive to give narcotics in a case of this type. The stupor simply masks the danger. Better far let the insomnious patient exhaust himself than stupefy him. Chloral, bromide, and the rest of the poisons that produce a semblance of sleep are so many snares in such cases.

Sleeplessness is a malady of the most formidable character, but it is not to be treated by intoxicating the organ upon which the stress of the trouble falls. Suicide, which occurs at the very outset of derangement and is apt to appear a sane act, is the logical issue of failure of nutrition that results from want of sleep. It is curious to note how a sleepless patient will set to work with all the calmness and forethought of intelligent sanity to compass his death. He is not insane in any technical sense. He has no delusion. He does not act, or suppose himself to act, under an "influence." He simply wants to die, and, perhaps, not until after he has made an attempt to kill himself will he exhibit any of the formulated symptoms of mental disease.

SCARLET FEVER BY POST AND BY ICE.—A correspondent of the *Medical and Surgical Reporter* narrates a case where it seems tolerably certain that scarlet fever was transmitted by means of a letter. At least there is much less room for doubt than in many cases where such a course is popularly assigned. The outbreak was in a country house half a mile distant from the nearest neighbor, and the family had occupied the house for three years; the children had not been away from the farm for two months, no one had been in the house who had the fever, or been where it was. In fact no case of the disease had been known or heard of by the physician for some months anywhere in the county. It appeared, however, that the mother had received a letter from her brother only a short time before, stating that his family had just lost a child from scarlet fever. This letter contained a photograph. The letter was received only seven days before the first child was taken sick, and the children all handled the letter and the photograph. A newspaper reports that scarlet fever has been spreading in Gloucester City by school children having eaten ice which had been used by an undertaker on the body of a person dead of the disease. The children picked up the ice in the street.

Colds and Coughs.

Coughs and colds are prevalent now, especially among children, too often from ignorance or carelessness of their elder guardians. Many mothers appear to accept with resignation the repeated and violent colds from which their children suffer as providential and unavoidable. A cold is by no means always due to exposure. Indigestion, constipation, a lack of scrupulous cleanliness, the unwise habit of sleeping in much of the clothing worn during the day, unaired bed chambers all, or any of these things may have far more to do with your child's tendency to cold than the keenest breath of the bracing winter air. And in great measure these things are under your control. Mothers should understand that it is a fact, whether they can see how it is or not, that numerous colds and sore throats are directly traceable to indigestion and dietetic errors. Quantities of greasy food, fried meats, pastry, and the like, ill-ventilated rooms, and continued constipation, have to answer for many cases of croup, and putrid sore throats. All these things weaken the system and render it far less able to resist changes of temperature. Give every bedroom a thorough airing every day, more especially if several children are obliged to sleep together, or with their parents. This is to be avoided, if possible; if not, always lower a window slightly from the top—or if this cannot be done raise it from below. There is frequently bad air enough generated and breathed in the sleeping apartment of a family with small children, to supply them all not only colds, but with a number of so-called "malarious" diseases, to last a year, perhaps longer. Neglect of bathing is another prolific source of colds. A child from three to ten years old should certainly receive an entire bath twice a week in winter. A warm bath at night, taking special care to avoid any chill after, will frequently break up a sudden cold. Keep children from playing in chilly, unused rooms in autumn and winter weather. Let them play out of doors as much as possible, taking care to have their feet warm and dry. A flannel suit and rubber overshoes will often save much cough medicine and doctor's bills. Keep them warmly clad, but do not be cootent with thick coats and worsted hoods, while short skirts barely cover their knees, leaving the limbs chilled.

A NEW PROCESS OF TOOTH-DRAWING.—A dentist of Geneva has invented a new and ingenious process of tooth-drawing, which, if introduced, will prove most acceptable to toothache sufferers. I small square of india-rubber, pierced with a central hole, is pushed over the tooth till the upper part of the root is reached. The india-rubber gradually contracts, pulls on the root, and the offending tooth is finally enucleated without causing the patient any pain whatever. Four or five days are generally required to complete the operation. Very slight bleeding and a slight swelling of the gum are the only inconveniences experienced. M. Paul Bert brought this ingenious method before the Academie des Sciences in Paris, when M. Galippe remarked that the process was already known, and quoted a case in support of its efficacy, in which a young girl had placed a ring of india-rubber round her two front incisors, and forgot that she had done so, the result being that she lost the teeth.

EFFECTS OF SLEEPING TOGETHER.—There is a good deal of logic and truth in the theory that injury may be sustained by one of two persons who are accustomed to sleep together. People differ in temperament, and the influence of temperament is either negative or positive. Positive natures are reflective; negative natures are absorptive. Of two persons who generally room together, the positive one, if of weakly habit, will lose elements of strength; they will be absorbed by the negative, and the result in time will be a decrease of physical energy and nervous power, which will be evident. We do not approve the practice of a sickly or weak person sleeping with a strong one. Healthy children of the same age may room together, but we should protest against an old person sleeping with a young one.—*Science of Health.*

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA

Amador.

AMADOR'S GOLD PRODUCT.—Amador *Ledger*, July 4: The gold product of Amador county for the year 1883, as compiled from the receipts of bullion at the Mint and other sources, foots up over $1,750,000, a heavy increase over the production of the previous year, but falling considerably below the estimate of Wells Fargo & Co. Of this amount the Plymouth Con. contributed over $1,000,000, or an average of about $90,000 monthly. The Keystone takes second place, with a total of over $300,000, and the Zeile third, the total output of which cannot be approximately ascertained. The present year is expected to largely exceed the figures of last year.

MISCELLANEOUS.—Work has been resumed at the Gover. Taking out water from the north shaft is in order. To drain this will take between one and two months at least. At the South Spring Hill a contrivance has been put up below the mill for the purpose of saving the fine gold and amalgam that escapes with the slime. It was put in operation this week. The Keystone is also fixing up for the same purpose. Work is to be resumed at Morgan's tunnel in Hunt's gulch forthwith. Proposals are out for making connection between the tunnel and shaft in Murphy's gulch, a distance of 230 ft. S. D. Shugert is interested with Mr. Morgan in the project.

Calaveras.

INTEREST IN A MINE SOLD.—*Chronicle*, July 4: A half interest in the well known Excelsion gravel mine, near the French Hospital, was sold one day this week for $1,000. The mine was owned by Judge E. Fahey and Mr. Manuel Nunes of this place. Mr. Nunes has disposed of his half to Mr. A. Knell, formerly Supt. of the Gleeson mine in Chill Gulch. The mine is a good piece of property, and we are informed that active operations will he commenced immediately.

El Dorado.

THE MELTON MINE.—Placerville *Observer*, July 5: This mine is situated about two miles north from the Mt. Pleasant, and, doubtless, is on the same vein of ore, in Mountain Township, its Postoffice address being Grizzly Flat. It is owned by an Eastern Co. with plenty of money, who purchased it some two years ago, and of which H. H. McClellan has been Supt. ever since, and during that time has done an immense amount of development work, on the mine, besides putting up a 15-stamp mill on the north end of the mine, which has already crushed a large amount of ore from tunnels No. 2, 3 and 4, much of which has been highly remunerative, and some of it lately worked went as high as $50 and $60 to the ton. It was found impracticable to work the mine through a shaft in consequence of the large amount of water they had to contend with, so the tunnel process was resorted to prospect, the claim being most favorably located for the purpose. Tunnel No. 2 has been run in 400 ft, and much of the ore in the last 100 ft run, went as high as $50 per ton. Tunnel No. 3 is in 350 ft, No. 4, 200 ft, and No. 5, 150 ft. All are in the hill about the same distance, and the ore in each is best near the end. Tunnel No. 1, 200 ft below No. 2, is now in 60 ft; the ore vein has not been encountered, but will be very soon, and will be followed through the hill 2,000 ft, to the south end of the claim, where hoisting works have been erected and the ledge sunk upon to some depth, the ore going $12 per ton. This tunnel will drain the mine to a depth of over 600 ft, and if the ore proves as extensive and as rich as that 200 ft above, and as the mine has steadily improved with depth, there is no reason to doubt that it will not be better, it does not require very close calculation to figure up the immense value of the property. An air compressor and drills are now being placed in position to facilitate the driving ahead of tunnels 1 and 2, and the ditch which supplies the motive power is being enlarged to a capacity of 500 inches, and by another week it is expected that everything will be in readiness to start up along the whole line, and no mine could possibly he better equipped for effective and economical working.

Inyo.

MODOCK.—Inyo *Independent*, July 5: Supt. Fitzgerald sends us the following: Coal is coming in in regular and will have enough to start up with by the 9th instant. During my absence there was extracted 120 tons of ore and selected slag. Total at furnace, 609 tons. The average of the ore, new find, is 43 per cent lead, which is the highest ever attained in this camp. I will be able to work in considerable quartz ore which has been laying here for years. This lead ore is being extracted from No. 2 tunnel of the Confidence mine.

SNOW'S CANYON.—"Miner" writes us that W. K Miller started the Snow's canyon mill on the 1st of July on ore from his mines at Wild Rose. He has had a 12 mule team hauling wood and ore for the last month. He is the first to take out ore from these mines. Smith and others will furnish ore to the mill. Snow's canyon is coming to the front as a bullion producer. There will shortly be some glowing items from this forgotten district.

MAXIM MILL.—The Maxim mill will commence crushing ore from the company's mine next Monday. There is enough ore on the dump to keep the mill pounding away for a long time.

Mono.

BODIE CON.—*Free Press*, July 7: During the past week there was 327 tons of ore crushed at the mill. The average assay value pulp was $23.48, and of the tailings $2.40. The south drift from upraise No. 4 is in 20 ft. The north drift from same is in 104 ft. Upraise from 500-foot level, Fortuna vein, is up 42 ft. The south drift on 550-foot level is in 56 ft. There is no change to note in the mine.

BODIE TUNNEL.—Advancement 14 ft last week, north drift, on 200-foot level.

STANDARD CON.—We extracted and shipped to the mills 504 tons of ore; received 795 ounces of crude bullion and shipped to the company this day $6,879.24. South drift No. 1 from south winze No. 2, 385-foot level, has been extended during the week 10 ft, and is now in 126 ft. The vein shows a width of two ft. Everything is running smoothly at the mines and mills.

BULWER CON.—The south drift from west crosscut No. 2, 4500-foot level, has been advanced during the week 10 ft; total length 317 ft. The vein continues about 1½ ft wide.

SHIPPING ORE.—Homer Mining *Index*, July 8: The Gorilla began shipping ore to mill last Sunday, but soon afterward an accident occurred which caused a suspension of shipments for nearly three days. The brake on the bull-wheel failed to work while a loaded car was descending, when the car was precipitated to the foot of the mountain with great force, doing considerable damage to the ore chute and bin. At the same time the ascending (empty) car flew up the mountain with equal velocity until it reached the end of its tether, when the cable snapped and the heavy iron car was thrown high into the air and then went thundering down the precipitous slope, a distance of about 2,600 ft being badly wrecked. Everything is now in good running order. It turns out that it was Uncle Dan Oisen, and not a Mexican who made the rich discovery near the head of Callihan creek, mentioned last week. A tunnel is being driven in with the vein, and is gaining one foot in depth for every foot in length. The vein is four ft in width, is enclosed in porphyry, the quartz so decomposed as to be readily torn down with the pick, and the whole bears a striking resemblance to the surface workings of the Standard mine in Bodie. The rich streak varies in width from five to eight inches, but the whole width of the vein carries gold, and the entire mass taken together, will probably average $70 to the ton. A pack-train started on Tuesday transporting ore from the Bryant mine to the Butterfield mill, which has been put in good running order and will be started up to-day. As Bryant ore is all of high grade, additional blanket sluices have been put in and arrangements made for saving the whole of the concentrates. The mine is looking as usual, both the north and south drifts, 130 level, being still in fine ore, and the dump is over-crowded with ore from the same level. The May Lundy mine is running full handed, and the mill is kept up to its full capacity. The bullion shipments are regular and, we learn incidentally but indefinitely, are large, but the amount or value thereof the public is not allowed to know. The road from tramway to mill is in excellent condition, and the ore yard at the mill is being gradually filled up. Nothing definite is known of the current yield of the Virginia creek hydraulic mines, but it is safe to conclude that it is quite heavy, as the company has the greatest aboundance of water, favorable weather and a large area of gravel known to be rich in coarse gold. Eighteen pounds of gold was the result of a single cleanup a few days since. The Great Sierra tunnel, Tioga district, is said to have reached only the selvage or eastern and somewhat massive casing of the Sheepherder ledge, and not to have penetrated the vein proper. The flow of water from the face is still heavy. Work has been suspended for a week or so, and the miners have scattered off to visit their friends. Next week this (Homer) district will have three quartz mills running and three mines producing bullion regularly.

Nevada.

RICH ORE.—Nevada *Transcript*, July 3: A candle-box of specimens from the Peabody mine in Grass Valley township, were brought to this city yesterday, and twenty pounds of the ore being crushed, yielded $145 in free gold. The Peabody is now open to a depth of 190 feet, and is producing ore from two levels right along. The average yield approximates $100 a ton, the ledge being from 6 to 12 inches thick. Among the stockholders are J. E. Brown, Phil. Richards and John Spaulding of the city, the first-named gentleman being President of the Company.

NORTH BLOOMFIELD MINE.—Grass Valley *Union*, July 3: About forty men are employed at the North Bloomfield mine, thirteen of them being engaged in running prospecting tunnels into the face of the bank to ascertain if the mine can be profitably worked by the drifting process, and most of the balance putting in their time cleaning bedrock. The main prospecting tunnel is in a distance of 100 feet, and is being put forward at a good rate.

Placer.

THE GOLDEN GATE AND OTHER RICH MINES.—Placer *Argus*, July 3: We were shown a number of nuggets of gold a few days ago which were taken from the Golden Gate Placer Mine near Iowa Hill, worth all the way from $3 to nearly $100 each, amounting in all to several hundred dollars worth. This gold we are informed is only a small portion of like gold, which has been picked up from the bedrock within the last month, during the process of working the mine. We can call to mind several very rich mines of to-day, which were abandoned in early days after the owners had supposed the claims were all worked out; for instance, the Watt Brothers' mine near Iowa Hill; the Weske mine at Sucker Flat, near Iowa Hill; the Golden Gate mine in the same vicinity; of which are demonstrating by their yield of gold from the rich pay channels back in the hill that many of the early owners in these mines abandoned the fortunes that lay hidden just a little further back. The Watts Brothers' tunnel is several hundred ft in and they are taking out good pay; Mr. Weske is employing quite a large force of men and they are a long distance into the hill and are working both ways on the channel up and down the ridge and taking out big pay. The Weske or Sucker Flat channel and the Golden Gate channel are supposed to be one and the same lead. These mines are situated only a short distance from each other, and from the similarity in the gold and also in its these two mines are working on one and the same formation there can be hardly be a doubt but what channel. Both of them were found to be very rich in front, and when the front of each were worked out it was thought the mine was worked out, but subsequent developments show the fallacy of this theory. Mr. Weske has taken out several large nuggets ranging in value from $100 to over $1200 each; and from the quality and quantity of the gold shown us from the Golden Gate mine the other day, it would seem that the present owners of the mine are now on the old lead or pay channel, and will undoubtedly take out big pay again as the early owners of the mine did when they worked the front, and from three to four acres of ground extracted nearly $250,000.

Plumas.

HALLSTED MINE.—Plumas *National*, July 3: The news from Rich gulch is good, and gives promise that the Hallsted mine will soon be on the boards as one of the very best in the country. The workings recently developed a very rich vein, of which extravagant reports come to us, some of them putting the rock at almost fabulous figures. There is no doubt, however, that the boys have got on the right track, and will make money rapidly. They are running one arastra, and will soon have another at work. We hope to go down that way in a short time.

BIG GOLD AND PLENTY OF IT.—A big strike has been made in Mr. F. B. Whiting's French Ravine claim, on the East Branch. The Company have prosecuted the prospect work there for some time with but little success, and some of the stockholders had become discouraged, but the news had a wonderfully bracing effect, and French Ravine shares are now at a high figure. The rich pay rock is in a small vein, running parallel with the main ledge, and is literally studded with gold, many of the pieces being magnificent. Some two or three tons of very rich rock are now on the dump-pile, and more is being added to it daily. The opening in the vein is now ten ft in length, and the one extending into the mountain grows richer as the tunnel progresses, while the other end holds fully as good as at first. This proves that it is not a "pocket," but simply a very rich vein, and it is hard to tell how much will be realized from it. The rock will certainly yield hundreds of dollars to the ton, and it looks as though a big bonanza would be the result to the stockholders. Mr. Whiting has persevered in the working of this ledge for several years past, and he certainly deserves the rich pay which he is now finding. He is down at the mine at present, and will attend to it very closely from this time on.

San Bernardino.

RED JACKET.—Calico *Print*, July 5: This mine has recently been leased for two years by A. Barber, who has been engaged in mining matters in Calico for the last two years. His confidence in the camp has increased to such a degree that he has gone to work in earnest to develop this promising piece of property, and, fortified with his experience in this remarkable camp as well as in other districts, he is prepared to design plans of operations, and execute them with such a degree of accuracy as to make success almost a matter of certainty. Enough ore has already been extracted to pay for the present expenditures and leave a margin—a margin that will become a handsome daily dividend when the mine is developed to such a degree as to warrant the erection of a quartz mill. Seventy tons of ore are on the dump that will mill $80 to the ton, and when the quantity reaches 100 tons it will be reduced to bullion. Seven men are employed in developing the mine. Near the east end of the Burning Moscow a tunnel has been driven in 100 feet within 100 feet of the north line of the King, on a line with the fourth level of the latter, with which it will connect and he used as an important thoroughfare between the two mines. This tunnel will strike the foot of the ledge when it is extended about twenty feet further, and will cut the vein about 180 feet below the apex of the croppings. A tunnel has also been started below the lower works on the Mammoth, and will cut the vein 75 feet lower than any opening that has been made on the Red Jacket on the south. The Red Jacket is very favorably located in a mineral belt that will prove to be an extensive and profitable field of operations, judging from the successful progress of its neighbor, the King, which is turning out every day bars of bullion.

LAVA BEDS.—The mines in operation at the Lava Beds are looking well. The Meteor and Mammoth Chief have virtually closed down until the warm weather is over, there being but two men left in charge. These mines have been operating in ore, a considerable body of low grade ore being uncovered and small quantities of high grade ore taken out. The indications of these mines developing into first-class property are good. The Morning Star company have eight men at work. The face of the tunnel is in good ore, and the indications are that a considerable body of fine ore is being opened. Ten carloads were recently shipped from the several mines in operation in this locality to Osborne's mill at Melrose, Alameda county, the returns from which will determine the extent of future operations in this new camp. Although this camp is slow it is sure and certain to build up on its own merits. All interested parties entertain the strongest hopes that it will eventually become a flourishing camp.

IMPROVEMENTS AT CALICO.—Cor. San Bernardino *Index*: One of the grandest schemes that has ever been talked of in Calico is now in contemplation by the King Mining Company. They have in view the construction of a reservoir on top of the little hill to the left of the road leading to Calico. They will have pipes running to it from Bob McChristian's well on the dry lake, about a mile below the reservoir, and the water will he forced up to it by steam pumps. From here the water will be piped to the foot of the King mine. Pipes will then be laid to all the business houses of town, which will obviate the necessity of hauling water to the camp. This is a grand scheme and should be carried into execution by all means. For the past two years the town has been paying three cents per gallon for all the water it has used, and if this scheme is carried into effect will then be much cheaper.

Sierra.

A RICH STRIKE.—Sierra *Tribune*, July 4: John Fessler recently located a ledge near Alleghany that has caused considerable excitement in that vicinity. The claim is located higher up the mountain and east of the Bullion mine, on Kanaka creek. The vein crops out on the surface for quite a distance, and in one place 15 ft wide. Where Mr. Fessler has sunk seven ft and obtained some very rich ore, the ledge is three or four ft wide. During the first quartz mining excitement around Alleghany a Spaniard discovered what is now supposed to have been this ledge, and sunk a shaft some 15 ft on it. The fine specimens he exhibited caused quite a furor among the early pioneers, and many efforts were made after the Spaniard left to find where he worked. The ledge taken by Fessler has been traveled over for many years, but no one ever supposed it contained gold, and consequently nobody has taken the trouble to locate it. Since Fessler has located the ledge and found very rich specimen quartz right on the surface, many people around Alleghany now believe that this is where the Spaniard obtained his big prospect in early days. The owner of the ledge was in Downieville last week and stated to the writer that he thought this ledge and that of the Hope mine over on the Minnesota side, were one and the same vein. If this should turn out to be true there is an excellent opportunity for some company of means to open up a big mine. The ledge could be worked to a great depth by running a tunnel from Kanaka creek, and at the same time water could be obtained from that stream for all milling purposes.

HOG CANYON.—*Mountain Messenger*, July 5: P. A. Lamping was down from Hog Canyon Sunday, and informs us that he struck the old works in the Good Hope ledge, from which the workmen were closed out years ago by a cave. The part of the old work tapped by this new tunnel which goes in on a level with the mill is an upraise from the 200 foot level. In a drift the workmen found the tools left by Bob Jones—wheelbarrow, picks, shovels, etc. Mr. Lamping knew of this unworked part of the ledge, and has been running for it from the start, but did not expect to be lucky enough to strike it without some search. The rock taken from this raise by Jones was the best ever found in the mine, several runs being made from it, averaging about $10,000 each. Some very fair rock was encountered before reaching the raise, all of which has been carefully culled and saved. He hopes to be able to start the mill in a week or two, and knows of rock enough to make several good runs.

Siskiyou.

PICK AND PAN.—Yreka *Union*, July 3: Mr. John H. Woods of Rocky Bar on Klamath river says that all the machinery has been erected in the claim in which he is interested and that work will commence at once. The company at Oregon Bar, just above his claim is also ready for work and has probably started by this time, all the machinery being in working order. Mr. William McConnell was in the city Tuesday and says that the electric light was thoroughly tested in his claim on the Klamath river last Monday night and proved entirely satisfactory. The surface dirt in the McConnell claim is paying unusually well and when the bedrock is worked it will no doubt prove to be extraordinarily rich. Mr. C. H. Pyle has purchased the ten stamp mill formerly used at the "Eliza" mine on Deadwood. The mill will be taken down and removed to Yreka, but in all probability will be put up at the Humming Bird mine on Deadwood this fall. Its removal here is to prevent its destruction by forest fires. Mr. Charles Junker visited the Empire quartz mine at Klamath river last Sunday and reports the ledge to be very rich for a distance of 40 ft. The ledge is five and a half ft wide and the full body is being followed to test its permanency. As tunneling progresses the rock changes somewhat in appearance but the prospect remains the same. Over a thousand tons of rock is now in sight, and the richness of it will justify the owners in making any needed outlay for further development.

Trinity.

DEADWOOD AND VICINITY.—*Journal*, July 4: In company with Dr. S. L. Blake and J. W. Philbrook, we paid a visit to the Brunswick Mine, on the French gulch side of the mountain, last Saturday, and found everything looking well and work progressing satisfactorily. Parties conversant with the property say it is a $20,000 mine. On the road through Deadwood and at Lewiston we heard of general prosperity at the various mines, but gathered no special information regarding any of them. McDonald & Franck have their new five-stamp mill on the ground and will soon have it erected and in operation on ore from their Barted mine which is very rich. R. N. Davidson has his Cannon Ball mill in operation and it is said to work well—Lambeth's mill is running on Brown Bear rock and the sulphuret reduction works are in operation. Generally speaking the district is prosperous as usual.

Tuolumne.

MINING IN TABLE MOUNTAIN.—Tuolumne *Independent*, July 3: A few days ago we visited the "Branch" Saratoga mine, owned and operated by W. H. Harding and N. Fales, of Springfield, and B. Keith, of Columbia. This mine is located on Table mountain and adjoining the J. Richards' claim in Springfield, and was originally located under the name of Saratoga, simply. We call attention to this mine, at this particular time, in substantiation of prior statements we have made relative to the vast undeveloped wealth of the ancient river channels traversing the county. The operations of the present Co. has been carried on through the old works and have just reached a part of the unexplored channel (virgin ground) which is developing immensely rich in auriferous gravel. Thus we see no reason why the miles of unbroached river channels in Table mountain, in many places, are not as rich as some parts of the channel proved that was mined years ago. The outlook of this mine, so far as opened out, is most promising indeed; from which, it may be safely said, the Co. will he richly rewarded for their perseverance and for the enterprising spirit manifested in the prosecution of the work necessitating the practical development of the mine.

GOOD QUARTZ.—*Union Democrat*, July 5: In the Lamphier shaft, at a depth of 340 ft, there is a large strong vein of good quartz. The runs at the mill continue to be of a most satisfactory character. It will be necessary to close down the mill for a while until a new engine can he procured, the old one in use having become incapacitated for doing the work. When the new engine is put in, the crushing capacity of the mill will probably be increased by the addition of another five-stamp battery. J. A. Davis and John Skae, who recently purchased the Dead Horse mine at Summersville, are pushing ahead rapidly with the work of development. A vein of good milling quartz has been struck in the shaft, but the extent of the chute cannot be determined until levels have been opened and drifts run.

NEVADA.

Washoe District.

CHOLLAR.—*Enterprise*, July 4: The Cornish pumps at the 2900 were completed, all connections made and the entire system set in motion at 1:30 P. M. Friday, June 27th. The bulkhead in the Cholar south drift on the 2600 is being rapidly constructed, and the main lateral drift south at the 2800 has been cleaned out. The work of drifting at this point was resumed last Tuesday. No crosscutting to the ledge will be done until the south lateral is driven ahead 200 or 300 ft beyond the present point.

HALE AND NORCROSS.—Work has not yet been resumed on the 2800 level and probably will not be

until after the bulkhead on the 2600 level of the Cholla is completed. Owing to the Superintendent of the Mexican mill, Evan Williams, having been injured by a fall the full returns from that mill have not yet been received. Over 1,000 tons of ore have been sent to the Eureka mill, and the shipments continue to be 500 to 600 tons per day.

POTOSI.—Last Tuesday the work of drifting was resumed in the main lateral drift on the 2800 level toward the ground of the company. On Friday, June 27th, the Cornish pumps at the 2900 level were connected with the hydraulic system of the levels above, and all the pumping apparatus is now working very satisfactorily.

SIERRA NEVADA.—The work of putting in column at the hydraulic pump in the joint Union Consolidated winze is completed. The diamond drill, which has been put into the north drift on the 3100 level is showing quite a flow of water. The drill was put into west crosscut No. 3, and has been extended over 160 ft.

ATTILA CON.—The north lateral drift is out about 450 ft. It is being advanced at the rate of 80 ft per week. It is still running along a smooth clay wall with low-grade quartz, yielding no assays on the west side.

MEXICAN.—At the 3200 level have completed the pump tank, placed in position a donkey pump and resumed sinking. During the week the winze will be deepened six or seven ft. The material at the bottom blasts badly. This work is being done jointly by the Mexican, Sierra Nevada and Union Consolidated companies.

GOULD AND CURRY.—At the old sixth station (825 level) of the Bonner shaft a drift will soon be started that will explore a large amount of virgin ground at and above that point.

BEST AND BELCHER.—Good progress is being made in the joint Gould and Curry west drift on the 2500 level. Work is also in progress in the east drift on the Consolidated Virginia line on the 1200 level, where some very promising material is being encountered.

YELLOW JACKET.—Sufficient ore is being extracted to keep the Brunswick mill, on the Carson river, in constant operation. The exploring drifts are finding a considerable amount of ore that will pay for milling.

OPHIR.—Are cutting out a station at the 560 level in the main shaft, from which a drift will be run west under all the old workings in order to drain and ventilate them.

ALTA.—The east drift on the 2150 level is still in comparatively dry ground and is making fair progress. The diamond drill is being run west and drifting in that direction will soon be resumed.

CROWN POINT.—About the usual amount of ore is being extracted and sent to the mills. A considerable amount of ore that will pay for working is being opened up by the prospecting drifts.

SAVAGE.—All is now in such shape that prospecting may be resumed whenever the officers of the company shall decide to begin operations at any point on the levels now opened.

CON. VIRGINIA.—The east drift on the 2000 level is being advanced at the rate of about 30 feet per week. It is passing through vein material of a promising appearance.

UTAH.—The main south drift on the 1950 level is still in a promising formation largely composed of quartz. There is no trouble with water.

ANDES.—Some paying ore continues to be found, and the exploring drifts show a good deal of quartz that looks well and promises to carry ore.

SCORPION.—Work is progressing as usual in the main west drift on the 500 level. The rock remains about the same as heretofore noted.

BELCHER.—The usual amount of ore is being extracted, and the prospecting drifts are finding some good material.

SUTRO TUNNEL.—Following is the report of progress and details of work in the Sutro tunnel from June 1st to 30th, inclusive: Main Tunnel—During the month the repairmen have placed on the drain boxes, west of point 12,500, 500 new covers and 12 sides of 3x12x20 plank, and east of point 12,100, 600 new covers and 15 sides; also, repaired the track and placed guard plank on both sides of the same, between points 12,900 and 13,200, and at other points along the line of the tunnel. South Lateral—Sub-drain cleaned out south and near the Yellow Jacket shaft, and 1,500 ft of guard plank replaced that had been removed to clean out the drain. Retimbered ground north of point 6,300 for a distance of 53 ft 3 inches, and south 27 ft 7 inches, and between points 2,500 and 2,700 removed 62 posts and 26 caps of old timber, squared the ground, cleaned up the debris and put in place 53 posts and 25 caps of new timber; also, lagged and braced the same.

Columbus District.

MOUNT-DIABLO.—Candelaria *True Fissure*, July 5: The west drift from winze No. 5 is in 81 ft, and still shows small spots of ore of good grade. The east drift from the north crosscut, west of the shaft on the third level, is in 39 ft, and shows but little of value. The west intermediate, between the second and third levels, is in 96 ft, and shows some low-grade ore, but the ledge is more broken. The west drift from the raise connecting the second and third levels is in 22 ft, and shows some $40 quartz. A drift has been started from the south crosscut, east of the shaft, on the second level, and shows a little ore of good grade. The east drift from the north crosscut on the second level, is in 119 ft, and shows a small streak of $70 ore. In the intermediate, between the first and second levels, the west drift is in 71 ft, and shows some $40 quartz. In the drift from the north crosscut, west of the shaft on the first level, there is a little good ore, and in the same part of the mine a west drift on some $70 quartz looks promising. The incline has been sunk 15 ft during the week, and is now 182 ft below the third level. A chute has been put in at the fourth level, and work will be resumed on this level as soon as the waste stored there has been hoisted.

MAKING BORAX.—The present warm spell is the opening of the harvest among the people engaged in borax mining south of here. Cross & Trudo are about starting up their new works, and, it is learned, the Pacific Borax Works have been leased and will soon be in active operation. In addition there are several small ones, and all of them running to their fullest capacity. There are over sixty men at work near Columbus and south of there, who, it is estimated, will produce from seventy to one hundred tons of the mineral per month for the next three months.

Comet District.

HIGH GRADE ORE.—Piute *Record*, July 1: Willet and Clark shipped in several tons of high grade ore during the week from Comet District to Poujades. Jim Burrows, in that district, is now extracting rich ore from one of his locations. The ore is found between the slate and lime.

Tuscarora District.

CENTRAL CON.—*Times-Review*, July 3: Have started south crosscut, 150 level. Progress for the week, 28 ft.

ARGENTA.—South crosscut on the 400 level is in 164 ft. Rock continues very hard.

INDEPENDENCE.—The usual progress has been made with the work on the 300 level. On the 400 level the drift west has been extended seven ft, and the drift east eight ft. There is no material improvement to note.

GRAND PRIZE.—South drift in the 200 level is in 123 ft; progress for the week 31 ft. South drift, 300 level is in 370 ft. Upraise above the 400 is up 82 ft; progress for the week 600 ft. Stopes above the 500 producing some fair ore.

BELLE ISLE.—East crosscut, 450 level, has been advanced 8 ft; total length 152 ft. Connection will be made in a few days at this point with the winze that has been sunk on the "west" vein from the 350 level. Joint Belle Isle and Navajo upraise on the "east" vein, 250 level, has been carried up a total distance of 23 ft. Have started a joint crosscut on the 150 level to the "east" vein.

NORTH BELLE ISLE.—No. 2 crosscut, 350 level, has been extended a total distance of 100 ft. A vein has been cut at this point, that shows good ore. The crosscut will be continued to another vein that lies beyond. Drift north, on the 70 level, has been advanced seven ft. The face of the drift still follows the small feeders of rich ore.

NAVAJO.—The development work on the "east" vein is in good ore at all points. The Joint Belle Isle and Navajo line upraise east vein 250 level, has been carried up a total distance of 23 ft. South drift from No. 1 crosscut, same vein and level, extended 13 ft, No. 1 upraise, 15 ft south of No 1 crosscut is up 58 ft. To connect with this upraise; winze from No. 1 crosscut, 150 level has been sunk a total distance of 35 ft. The usual amount of work has been forwarded in the old workings and the usual supply of ore has been extracted.

ARIZONA.

HUMBUG.—Cor. Phœnix *Herald*, July 3: From Mr. Woodworth I learned that Turkey creek has quite a mining boom. No large mining enterprises are found south of Prescott, but aggregate developments are now more extensive than ever before and are being prosecuted systematically, the ore being shipped to Pueblo, Colorado, for reduction. Arastraing is becoming an extensive industry in the south half of the county, including the top of Delpasco mountain. Milling is certainly looking up. The Groom Creek has made a successful run and is preparing for another. The Senator mill is being removed to Lynx creek. Two mills are being erected on Turkey creek. The Tuscumbia mill is running on ore from the Lane mine. The Basin mill has been leased by Joe Millner and Bob Cartnell, two engineers and practical mill men. This mill has been a political machine and it will be hard to reinstate it in the confidence of the miners. The Basin mill is surrounded with good ore and need not lie idle a day. The Lane mine is generally regarded as the best silver mine in Yavapai county. Messrs. Hayden, Brittenhans and Boner developed their property, originally known as the Lorennia mine, with a persistency that should be imitated, and certainly they are entitled to the reward now in sight. When they started in to develop the prospect in the fall of 1879, they had no means to start with and but few tools. They went to work for wages and then got themselves an outfit, and from that time to the present they have worked for wages and worked on their mine, but always made it a point to work and keep out of debt. They have sold about $1,200 worth of ore, a very few tons, and with this and their wages, they have sunk two shafts, about ninety ft each, one of them on the ledge and the other a perpendicular shaft off to one side of the lead, and have run about 130 ft of drift along the lead and took out and assorted about 400 tons of ore that is now piled up at the mine. They calculate they have about 800 tons more to stope. Mr. Hayden was imperative in his demand that the mine should not be over-rated. He thinks the ore will work about $100 a ton. They have made a proposition to lease the Tiger mill and work their own ore, after which they will erect hoisting works and explore their mine in depth.

CONCENTRATORS.—Phœnix *Herald*, July 3: Six large concentrators have been built at Wickenburg to work the tailings from the Vulture mine. The Benson company use these concentrators at their reduction works. A large pump is en route for Wickenburg and will be erected as as soon as possible. R. E. Farrington & Co. are handling considerable ore for the chlorides in the vicinity of Gillett. Small quantities are received and held until sufficient quantities accumulate to make a carload, in order to reduce freights. This is of much importance to miners in the vicinity of Tiptop, who have been quite successful this year. We learn that the Golden Fleece mill will do custom work, in lots of 100 tons, for $10 per ton. By this means miners can develop their properties, support themselves, and at the some time prove whether their mines are worth the expense of mills, etc. Custom mills are of much benefit to poor miners.

COLORADO.

NOTES.—Georgetown *Courier*, July 3: The Georgetown Public Ore Market is doing a rushing business, and is treating a large amount of ore. The Miners' Sampling Works, of this city, treated and shipped 250 tons of ore for the month of June. The German Friend mine, situated in the West Argentine, near the Baker is to be started up immediately under the management of F. H. Burger and Albert Hundchen. The West Rogers is being worked by Rube Mersenau & Co. They are at present drifting on the vein. It is their intention, however, to begin sinking at once. The work of development goes steadily on at the Buckeye State mine under Omer Sheppard. The East Rogers on Democrat mountain is in better shape now than ever before. The McVeaty lease, is turning out some excellent mineral. Stoping and drifting goes on uninterrupted and with flattering results. A contract for 60 ft on the Bonanza tunnel has been let to Hugh Thomas. The tunnel is now 800 ft in length and will soon intersect the White Pine lode, when a large body of mineral is expected to be encountered. Joe Powers & Co. are drifting ahead on the west extension of the Polar Star. The prospect looks well. G. H. Gilbertson still continues to push work on his Kongbergs lode. The ore streak improves as the work of development goes ahead. A party of lessees are drifting ahead on the 2d level of the Silver Cloud. They are now 1,400 ft from the surface and will within 100 ft cut the Matilda Fletcher vein. A marked improvement is noticeable in the appearance of the Blue Grass vein. The mine has been equipped with a new car and track. There is said to be over 300 ft of water in the Terrible shaft. A force of 20 men are engaged in opening up the Tishomingo lode on Brown mountain. A fine streak of 600 ounce mineral has been encountered.

MONTANA.

PLACER MINING.—*Inter-Mountain*, July 6: The placer mines, which first attracted the attention of miners to this district and which in the sixties were supposed to be its only source of wealth, still contribute a liberal quota to the output of the camp and have been in continuous operation every season since the first discoveries. Mr. A. W. Barnard who came here in '68, and who has since acquired a good deal of valuable quartz property still stays with the placers. He is working a force of seven men, and from the excellent "prospects" he obtains, has evidently struck a richer piece of ground this season than any he has worked for many years. The length of the season here during which enough water is available for placer mining averages 90 days. During the past ten years the gold product of the Barnard claim has been over $100,000. This year the yield promises to be not less than $12,000. The claim embraces enough ground not yet worked to last six years, during which time it is good for from $60,000 to $75,000.

THE GRANITE MOUNTAIN.—The Granite Mountain, which is justly entitled to the distinction of being considered the richest silver mine in Montana and which in one brief year has placed half a dozen men in affluent circumstances, is being developed with an energy born of its recently ascertained wealth, and a well founded confidence in its future. Operations are now conducted in three tunnel levels, the lower one being 1,200 ft into the hill and its face about 400 ft from the surface. The first-class ore body which has been followed in level No. 3 for several hundred ft without a break or a pinch, varies in width from four to five ft and according to the most cold blooded samples assay 200 ounces per ton. Considering its width and length it is by far the richest silver ore body ever opened in the territory, and when stoping shall begin the output in dollars will far exceed that of any other silver property in the west. The erection of a 20-stamp mill has already been contracted for with the well known firm of Frazer & Chalmers, who have sent out Mr. Angus McKay, a thorough mechanical engineer, specially to superintend its construction. When completed it will be the finest structure of its size in the territory in the point of solidity, durability and capacity, and will be of material assistance in bringing Philipsburg to the front as a bullion producer.

BUTTE'S PRODUCTION.—It is a fact that very few people in this district and none outside of it seem fully to appreciate the enormous and continued productiveness of the mines of Butte. They have a general impression that some big mines are in the vicinity, but seldom take the trouble to reflect upon or investigate the results of the operation. On an average during the past three months forty carloads, containing in the aggregate 400 tons of ore and matter, have daily left the Butte depot. Of this amount, at least, 100 tons is matte. Estimating the ore from which the matte is produced to contain 20 per cent copper, the matte thus represents 500 tons of ore, which added to the crude ore shipments (about 300 tons), makes 800 tons from the smelters and copper mines alone, leaving out of consideration the low grade concentrating ore which is left on the dumps for future treatment. The silver mills of Butte are all in operation, working their full complement of stamps and are daily reducing ore as follows: Alice, 90 tons; Lexington, 50 tons; Silver Bow, 30 tons; Moulton, 45 tons, Dexter, 28 tons; Old Lexington, 10 tons, total 253 tons. If thus appears that the total amount of copper and silver ore raised from the mines of Butte every 24 hours and either reduced here or shipped away for treatment aggregates 1,053 tons. This daily production places Butte first among the great mining camps of the country. Leadville, it is true, produces a greater tonnage, yet the value of its output is less than that of Butte. At the present rate of production this camp will produce during the current year more money than any other camp in the world. If the Anaconda smelter should start up in September, as it is likely to, Butte will not finish at the lead, but it will distance all competitors in the contest.

NEW MEXICO

GENERAL NOTES.—Silver City *Enterprise*, July 3: The Pinos Altos Gold and Silver Mining Company started their mill yesterday to run permanently, having previously tested it. The mill is one of the most complete and perfect in the territory. The Montezuma mine, at Cook's Peak, has not been leased to the owners of the Deming smelter, as reported. The proposition of the smelter of thirty-five cents per unit for lead and $12 per ton for treating the ore was not accepted by Messrs. Crawford, Miller & Higbee, the owners of the property. The names of forty-nine men were on the pay roll of the Old Man mining company at Fleming, on Saturday night last. On Monday the force was increased and at the present time, including the men engaged in hauling ore, must number in the neighborhood of seventy-five. The men are not required to work on Sundays. Carroll brothers' Silver Cave mine, in the Florida mountains, near Deming, is steadily swelling Grant county's output for this year, and making a fine record for itself as a producer. Weekly shipments of ore are being made to Kansas City and Pueblo, and the returns are reported as being very large. Another wagon train laden with concentrates from the Cooney mine, at Alma, arrived in town on Tuesday. Three cars of concentrates and high-grade ore have been shipped from this property within the past three weeks, and are delayed by washouts between Albuquerque and this point. The mine will make a splendid showing for the present year. Since the new order of things at the Old Man mine, 32 tons of ore that will average 200 ounces have been sacked and shipped. A great portion of the low-grade ore is being piled on the dumps and reserved for the contemplated mill to be erected at Fleming this fall. Developments thus far have been very satisfactory, and ore of good grade is in every opening. The Hancock mine, in Tres Hermanas district, owned by Meredith & Allman, of this city, has been leased to a man named Connolly, with the understanding that he must have a thirty-ton concentrating plant upon the ground within one month, and Connolly, after letting contracts for the development of the mine, departed for Denver to purchase the necessary machinery for such a plant. During Mr. Connolly's absence a fine body of ore was struck in a new place on the claim. Our informant states that it is the biggest thing yet uncovered in Southern New Mexico, running many thousand dollars in silver, and it is to be hoped the report is true.

OREGON

MINING NEWS.—Jacksonville *Times*, July 3: Considerable prospecting is going on. Miners will soon commence getting ready for another season. Wimer & Sons, of Waldo, are still piping, but will soon commence cleaning up. Bybee & Newman are getting their claim near Waldo in shape for next season's work. The Sterling company has quit piping and is now engaged in cleaning bedrock. A good report is promised. Simmons, Ennis & Co. have suspended active operations on their mammoth enterprise near Waldo, owing to the scarcity of water. The hydraulic mines of McCall and Anderson, located this side of the Eagle mills, are still being worked on full time. A. G. Rockfellow is in charge. The Steamboat mines are turning out fairly and in another season we may expect something interesting from them, as several parties are engaged in opening them. A San Francisco company has secured a large area of mining ground in the Althouse district, Josephine county, and will soon commence the construction of a large ditch to bring water on it. Desselles & Co., of Scotch gulch, Josephine county, will soon commence making a final clean-up for the season, as water is failing. This is one of the best mines in Southern Oregon and will make a good report. Mr. Graham, who is engaged in mining in the Beaver Creek district, was in town Wednesday. He informs us that the mines there are turning out well. Among the gold he brought over was a nugget worth nearly $14. John Hall and Wm. Bybee have inaugurated a mining enterprise on Canyon creek, Josephine county, which they have great faith in. The ditch that will be necessary is only a few miles long, and operations will be begun on it at once.

A RICH DISCOVERY.—*Oregonian*: A few days ago an assayer of this city received several specimens of rock from Andy Wyland, of Clackamas county, which showed unmistakable signs of being both silver and gold bearing in considerable quantities. The assay was made with the following results: Per ton, silver, $235.10; gold, $25.01; total, $260.11. Wyland says that four men were at work on the mine from which these specimens were taken for ten days in the first part of June, making preliminary developments. A width of twenty feet has been uncovered, and a cut of forty feet made parallel with the ledge, on a dead level. Neither side-wall has been found, and the ledge has been traced for a distance of four miles. Free gold is plentiful in the rock, which is blue-whitish quartz full of pyrites and sulphides of iron, covered with chloride of gold. This chloride has not yet been assayed. The discoverer says that he has been hunting five years for this thing, and it "is the finest ledge he ever saw." As he is an experienced miner, this means much. He states that a capitalist of this city offered him $20,000—$2,000 down, and $18,000 in bonds—for the mine, but he refused the offer. The locality of this new discovery is in the Cascade mountains, about eight miles due south of Table rock, on a tributary of the south fork of a stream known as Henry creek, which makes into the main fork of the Molalla, one mile above Ogle creek. The road thither from Wyland's home in the foothills, which is in section 15, township 7 south, range 3 east, is a rude winding trail. The discovery promises to be the means of starting a mining boom in Clackamas county.

UTAH.

REVIEW.—Salt Lake *Tribune*, July 4: The receipts of bullion (excluding ore) in Salt Lake City for the six months ending June 30th, inclusive, aggregated as follows: January, $449,228.74; February, $364,606.47; March, $460,366.60; April, $432,809.44; May, $343,416.15; June, $539,532.90. Total, $2,389,960.30. The receipts of bullion and ore in this city for the weeks ending July 2d, inclusive, amounted to $109,002.93 of bullion, and $5,500 of ore; aggregate, $114,502.93. For the previous week the receipts were $116,888.96 of bullion, and $4,850 ore. The receipts of Horn Silver bullion for the week were eighteen cars, valued at $54,000; total output for six months, $1,136,000; total to date, $1,151,000. Sales of Horn Silver stock in New York for the past week, 1,120 shares, at these prices, viz.: June 24th, $5.25; June 25th, $5.25@$5.50; June 26th, $5.25@$5.38. The output of the Ontario for the week was fifty-two bars, assaying $37,102.93. Total product for six months of this year, $787,047.98; to date from January 1, 1884, $797,632.29. No sales of this stock are reported for the week in New York. The Crescent sent down one lot of ore, $2,200. The Stormont sent up two bars of silver, $3,650. The product of the Hanauer for the week was seven cars of bullion, $14,250. The hot season has come on in earnest, and the snow is rapidly disappearing from the hills.

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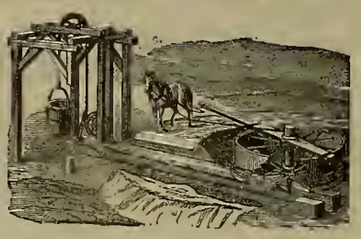

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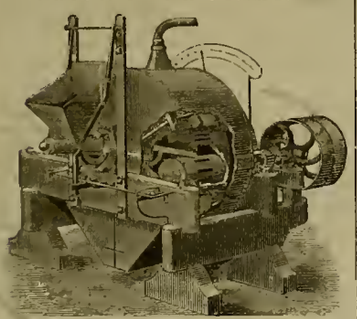

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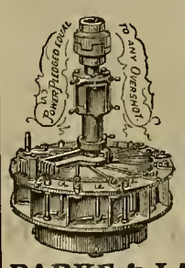

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Manufactured of BEST STEAM METAL. We claim the following advantages over all other Valves and Gauge Cocks now in use:

1. A perfectly tight Valve under any and all pressures of steam, oils or gases
2. Sand or grit of any kind will not injure the seat.
3. You do not have to take them off to repair them.
4. They can be repaired by any mechanic in a few minutes.
5. The elasticity of the Disc allows it to adapt itself to an imperfect surface.

In Valves having ground or metal seats, should sand or grit get upon the seat it is impossible to make them tight except by regrinding, which is expensive if done by hand, and if done by machine soon wears out the valve, and in most cases they have to be dis connected from the pipes, often costing more than a new valve. The JENKINS Disc used in these Valves is manufactured under our 1880 Patent, and will stand 200 lbs. steam. Sample orders solicited. To avoid imposition, see that Valves are stamped "Jenkins Bros." For sale by

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THIS WAS ONE OF THE FOUR WHEELS TESTED by the Idaho Company at Grass Valley, Cal., and gave 90 2 per cent., distancing all competitors. Send for Circulars and guaranteed estimates.

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12 LARGE CLAIMS, going from 14 per cent. up to 45 per cent. Situated in Cottonwood, Churchill county, Nevada, 40 miles east from Lovelock Station, C. P. R. R., Nevada, U. S. Ore is being shipped by car-load to London, England. Apply to

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San Francisco Cordage Factory.

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Constantly on hand a full assortment of Manila Rope, Sisa Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.

Extra sizes and lengths made to order on short notice.

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Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in building. Apply at the Company's office, 314 California street.

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Mining and Scientific Press.

THE MINING AND SCIENTIFIC PRESS is the leading mining journal in America, and enjoys a larger circulation among the more intelligent operators and workers in the gold fields of the world.

Established in 1860, it has firmly maintained its position as a reliable, progressive journal. The information given in its columns has saved millions of dollars to the practical miners, metallurgists, mill men, mine and share holders on the Western side of our continent.

Among its contributors are the ablest and most experienced mining engineers, superintendents and practical miners in this country.

The PRESS gives a condensed summary of Mining News from the most important mining districts of the country.

New processes and methods of mining are described in its weekly issues. New mining machinery and improvements are frequently illustrated and explained in a manner to be of great value to all interested in mining.

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Every public library, mining engineer, metallurgist, mining operator, and intelligent mechanic and manufacturer, will find profit by its reading.

Subscription, $3 a year in advance. Sample copies, prepaid, 10 cents.

DEWEY & CO., Publishers.

No. 252 Market St., San Francisco, Cal.

Mining Share Market.

The stock market has been quite active this week, and a small sized boom has surprised and pleased the operators. The movement seems in the direction of the middle Comstocks, Chollar, Hale, Norcross and Savage have gone up as our tables show, and some others have followed them. There was some talk of Alonzo Hayward trying to get control of Hale & Norcross, but he denies the rumor. Some sort of pool has evidently been formed to force stocks, but the source is unknown to the general public. All is progressing well at the north end mines. They are now in good shape to push the deep winze. The pump tank at the 3200 level has been completed and a donkey pump put in. Since doing this work they have resumed sinking the winze. All being now in shape sinking will progress as rapidly as possible, but the rock (a species of barren, bastard quartz) blasts very badly. It blows out in pot-holes. Good prospects are being obtained in the Jones lease of the California and Consolidated Virginia ground, and very promising material is being found in the exploring drifts of the Gould and Curry and Best and Belcher. In the Alpha and Exchequer mines they are now drifting along a vein of quartz that promises well, being a solid body with well-defined clay wall. All the leading mines of Gold Hill are shipping full amounts of ore, with plenty more in sight.

Bullion Shipments.

Horn Silver, July 1, $18,000; Ontario, 1, $10,359; Hanauer, 1, $4,000; Stormont, 1, $3,650; Horn Silver, 2, $9,000; Ontario, 2, $5,351; Horn Silver, 3, $6,000; Ontario, 3, $5,233; Hanauer, 4, $2,100; Nevada's ores, $750; Horn Silver, 4, $12,000; Ontario, 4, $4,160; Hanauer, 6, $6,500; Horn Silver, 6, $18,000; Ontario, 6, $9,880.

WATER IN STEAM.—Herr Stouple, of Lucerne, Switzerland, by adding fluorescine to the water of a boiler, which by calorimetric test enabled him to detect the presence of one half of one per cent of water carried mechanically out of the boiler by the steam, found that from 2.3 to 4 per cent was actually thus present in the steam. The deep green color of the water in the boiler was retained in it for weeks, and yet no trace of coloring could be detected in the water condensed in the steam cylinder, a proof that the water which gathers there is entirely due to condensation caused by the expansion of steam, and that very little water is actually mechanically carried away by the steam from the boilers.

THE schooner Alaska, which left here on a mining expedition to Alaska a year ago, is supposed to have been lost. A party of men had wintered at the mine, and had succeeded in getting out a considerable quantity of ore. The programme was for the schooner to run directly to her destination, and, after landing supplies and men, to take a cargo of ore on board and return at once to this city. The vessel has now been gone more than a year. She was seen by the Cutter Corwin last September, and is supposed to have sailed for this port shortly after.

THE Grant coal mine and the Youngglove mine, in Amador county, says the Ione Valley *Echo*, are doing a rushing business. The Grant mine is working 40 hands, and is shipping from 5 to 9 carloads daily. The Ione coal is meeting with favor in the cities, and is found to be the cheapest fuel that can be used in stationary engines or for heating purposes. There is an immense quantity of this coal from the Mokelumne river on the south to beyond the Amador county line on the north, and coal can be had for generations to come.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELIN'T	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M Co	California	5	1 50	June 23	July 28	Aug. 14	A Judson	320 Sansome st
Belmont M Co	Nevada	37	15	May 26	June 30	July 28	J W Pew	310 Pine st
Bodie Tunnel M Co	California	9	20	June 30	Aug 2	Aug 20	C C Harvey	309 California st
Butte Creek Hyd. M Co	California	9	10	May 15	July 10	July 30	B L Taylor	230 Montgomery st
Best & Belcher M Co	Nevada	30	50	July 19	Aug 14	Sept 2	W Willis	309 Montgomery st
California M Co	Nevada	12	20	May 20	June 27	July 24	C P Gordon	309 Montgomery st
Cneva Santa M Co	Mexico	2	10	May 19	June 24	July 15	W Letts Oliver	328 Montgomery st
Columbus Con M Co	Nevada	3	25	June 2	July 7	July 28	J M Buffington	309 California st
Champion M Co	California	15	10	June 13	July 17	Aug 6	T Wetzel	322 Montgomery st
Eintracht Gravel M Co	California	15	05	May 13	June 23	July 17	H Kunz	209 Sansome st
Excelsior Water Co	California	6	50	Jan 29	July 1	July 29	H B Wheaton	215 Sansome st
Golden Channel Drift M Co	California	1	03	May 22	June 23	July 23	A B Paul	328 Montgomery st
Grand Prize M Co	Nevada	16	25	May 16	June 20	July 16	E M Hall	327 Pine st
Gould & Curry S M Co	Nevada	48	50	June 6	July 4	Aug 4	A K Durbrow	309 Montgomery st
Loreto M and M Co	Mexico	7	50	May 21	June 23	July 9	H G Jones	327 Pine st
Mammoth Bar G M Co	California	6	15	June 9	July 11	Aug 1	J W Pew	310 Pine st
Mayflower M Co	California	24	10	May 9	June 12	July 7	J J Morizio	328 Montgomery st
Mexican G M Co	Nevada	27	75	June 11	July 16	Aug 6	C E Elliott	309 Montgomery st
Mono Lake H M Co	California	1	50	May 19	July 2	July 21	J C Winans	331 Montgomery st
Morgan M Co	California	1	1.00	June 7	July 11	July 30	C S Neal	309 Montgomery st
Moxo G M Co	California	21	60	July 8	Aug 12	Sept 1	G W Sessions	309 Montgomery st
North Peer M Co	Arizona	1	2.00	June 12	July 17	Aug 11	H Deas	309 Montgomery st
Peer M Co	Arizona	1	25	June 6	July 15	Aug 5	A Waterman	309 Montgomery st
Potosi M Co	Nevada	15	25	May 29	July 1	July 22	C L McCoy	309 Montgomery st
Real Del Castillo M Co	Mexico	2	30	June 28	Aug 4	Aug 22	A Judson	320 Sansome st
Rainbow M Co	California	11	15	June 16	July 21	Aug 18	P F Mohrhardt	311 Montgomery st
Starlight M Co	California	1	06	June 14	July 18	Aug 6	W Battles	513 Market st
Silver Hill M Co	Nevada	20	05	June 2	July 8	July 29	W E Dean	309 Montgomery st
Scorpion S M Co	Nevada	18	10	June 25	Aug 1	Aug 22	G S Spinney	310 Pine st
Union Con M Co	Nevada	27	50	June 9	July 14	July 31	J M Buffington	309 California st
Utah S M Co	Nevada	49	50	June 18	July 25	Aug 13	H S Pratt	309 Montgomery st
Valapara M Co	Mexico	2	20	June 28	Aug 4	Aug 22	A Judson	320 Sansome st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Best & Belcher M Co	Nevada	W Willis	309 Montgomery st	Annual	July 14
Mammoth Gold Bar M Co	California	J W Pew	310 Pine st	Annual	July 25
Savage M Co	Nevada	E B Holmes	309 Montgomery st	Annual	July 17

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	May 15
Bodie Con M Co	California	G W Sessions	309 Montgomery st	50	June 5
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	May 27
Idaho M Co	California			4.00	Apr 2
Jackson M Co	California	D C Bates	309 Montgomery st	10	Mar 16
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	June 19
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Apr 28
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Mar 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Apr 2

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING June 19.		WEEK ENDING June 26.		WEEK ENDING July 3.		WEEK ENDING July 10.	
Alpha	.60	.65	.60	.70	....	.80	.70	1.75
Alta	1.60	1.75	1.70	2.20	1.90	2.10	1.90	2.15
Andes	....	.25	....	.20	.30	.35	.40	.45
Argenta	....	....	....	....	....	....	....	....
Belcher	.70	.85	.70	.80	....	.70	.75	.85
Belding	....	....	....	....	....	....	....	....
Best & Belcher	1.00	1.60	1.15	1.70	1.50	2.10	2.10	2.70
Bullion	.15	.25	.20	.45	.35	.40	.40	.50
Bonanza King	....	....	....	....	....	....	....	....
Bodie Isle	.50	.60	.60	.80	.70	.65	....	....
Bodie Con	3.70	4.30	3.95	4.45	3.20	3.65	2.15	3.50
Benton	.45	.50	.50	.60	.50	.55	.45	.55
Bodie Tunnel	....	....	....	....	....	.20	....	....
Bulwer	....	....	.50	.65	....	.50	.50	.55
California	.05	.10	.05	.25	.20	.25	.25	.30
Challenge	....	....	....	....	....	....	....	.20
Champion	....	....	....	....	....	....	....	....
Chollar	1.40	1.50	1.50	1.65	1.00	2.15	2.05	3.10
Confidence	....	....	....	....	....	....	....	....
Con. Imperial	....	.10	....	....	....	....	....	.10
Con. Virginia	.10	.20	.10	.20	.15	.30	.25	.35
Con. Pacific	.35	.50	.35	.50	.40	.50	....	.40
Crown Point	1.10	1.25	1.10	1.25	....	1.15	1.20	1.40
Day	....	....	....	1.25	....	....	....	....
Eureka Con	....	....	2.00	2.10	....	....	....	2.50
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	.20	.30	.20	.25	....	.25	....	.30
Grand Prize	....	.10	.30	.35	....	....	....	....
Gould & Curry	.35	.85	.50	.70	.55	1.00	.55	1.80
Goodshaw	....	....	....	....	....	....	....	.15
Hale & Norcross	2.25	2.60	2.45	2.80	2.65	2.90	2.80	4.55
Holmes	....	....	....	....	....	....	....	....
Independence	....	.25	.35	.40	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	....	.20	....	.25	....	....	....	....
Martin White	....	....	....	....	....	....	....	....
Mono	.75	.85	.75	1.10	.45	.60	.30	.65
Mexican	.50	1.00	.55	1.05	.80	.90	.75	1.10
Mt. Diablo	....	2.10	....	....	....	....	....	2.00
Northern Belle	....	....	....	....	....	....	....	....
Navajo	3.15	3.45	3.40	4.30	3.80	3.90	4.05	4.25
North Belle Isle	....	.20	....	.20	....	.20	....	.20
Occidental	.90	1.00	....	....	....	.90	1.25	1.50
Ophir	.60	1.05	.70	.95	.80	.85	.85	1.10
Overman	....	.15	....	....	....	.15	.20	.30
Potosi	.40	.45	.40	.45	.40	.80	.80	1.80
Pinal Con	....	....	....	....	....	....	....	....
Savage	.60	.75	.70	.75	.70	.80	.80	1.15
Seg. Belcher	....	....	....	....	....	1.25	....	1.50
Sierra Nevada	1.00	1.55	1.00	1.10	1.00	1.10	1.05	1.50
Silver Hill	....	....	....	....	....	....	....	.10
Silver King	....	....	....	....	....	5.25	....	5.00
Scorpion	.10	.15	....	.10	....	.10	....	.15
Syndicate	.45	.50	.50	.60	....	.50	.45	.50
Tioga	....	....	....	....	....	....	....	....
Union Con	.60	1.00	.60	.80	.65	.75	.70	.95
Utah	.35	.50	.40	....	....	.30	.35	.60
Yellow Jacket	1.60	1.90	1.75	1.80	....	1.85	1.90	2.05
....	....	....	....	....	....	....	....	....

Secure the Reduced Rate.

After the first of April, 1884, we announced a reduction of the price of the MINING AND SCIENTIFIC PRESS from $4 to $3 a year to all who would settle up arrearages at old rates and pay *in advance* thereafter. There are some who have not yet taken advantage of this offer, and we would therefore urge all subscribers still in arrears to remit what is due us to this date, at the rate of $4 a year, and pay in advance for another term at the reduced rates for new subscriptions paid in advance.

Don't Wait to be Called On.

Our subscribers can do us an essential favor by sending their subscriptions to this office without delay. Please do not wait to be called on. We have actual need of all subscriptions due or over due. Prompt payment in advance alone will enable us to continue the publication of a first rate paper.

THE Bodie Consolidated paid a dividend of $1 per share, or a total of $76,933, this week. The whole number of shares in the capital stock is 100,000, but there are only 76,933 out.

THE metal workers are in convention at Chicago for the purpose of organizing a National Union. Shorter hours and better wages are there objects.

Sales at San Francisco Stock Exchange

THURSDAY A. M., July 10.

650	Alta	2.05@2.10	
170	Alpha	1.40@1.45	
340	Bodie Con	2.10@2.15	
400	Benton	.45c	
200	B. & Belcher	2.15	
100	Belle Isle	.65c	
2650	Con. Virginia	.30c	
1190	Chollar	3.40@3.50	
400	California	.25@.30c	
60	Crown Point	1.80@2.00	
100	Exchequer	.40c	
1935	Hale & Nor	4.20@4.50	
370	Gould & Curry	1.70	
100	Mono	.35c	
300	Mexican	1.05@1.10	
100	Mt. Diablo	2.00	
150	Navajo	4.10	
570	Ophir	1.20	
710	Potosi	1.90@1.95	
550	Savage	1.20	
230	Sierra Nevada	1.60	
505	Union	1.75	
100	Utah	.60c	
150	Yellow Jacket	2.70	

AFTERNOON SESSION.

100	Belle Isle	.65c	
100	Belcher	.50c	
550	Chollar	3.15@3.20	
165	Confidence	1.00	
200	Exchequer	.35c	
200	Gould & Curry	1.65@1.70	
600	Hale & Nor	4.35@4.40	
175	Mexican	1	
150	Ophir	1.10	
420	Potosi	1.70@1.75	
100	Sierra Nevada	1.50	
400	Savage	1.15@1.20	
130	Union	.90@1.00	

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, July 2, 1884.

ANTIMONY—Per pound	14 @	15
BORAX—Per Pound (extra)	16 @	—
IRON—Glengarnockton, ton	25 4 0 @	—
Eglinton, ton	20 00 @	—
American Soft, ton	29 0 0 @	—
Oregon Pig, ton	— @	—
Clipper Gap, Nos. 1 to 4	32 50 @	35 00
Refined Bar	3½@	3
Horseshoes, keg	5 50 @	—
Nail Rod	7½@	—
Norway, according to thickness	6½@	7½
STEEL—English Cast, lb	15 @	16
Black Diamond, ordinary sizes	14 @	—
Drill	15 @	—
Machinery	12 @	14
COPPER—Ingot	22 @	—
Brazers' sizes	25	27
Fire-box sheets	28 @	—
Bolt	25 @	—
Old	8 @	—
Bar	— @	—
Cement, 100 fine	12 @	—
LEAD—Pig	4½@	4
Bar	— @	6
Pipe	7 @	—
Sheet	8 @	—
Shot, discount 10% on 500 bags	Drop, ⅞ bag	2 10 @ —
Buck, ⅞ bag	2 30 @	—
Chilled, do	2 50 @	—
TIN PLATES—Charcoal	7 00 @	7 25
Coke	6 00 @	6 75
Terne	6 15 @	—
I. C. Charcoal Roofing, 14x20	6 25 @	6 50
ZINC—By the cask	9½@	10
Sheet, 7x3 ft, 7 to 10 lb, less the cask	9 @	10
NAILS—Assorted sizes	3 25 @	—
QUICKSILVER—By the flask	29 00 @	—
Flasks, new	1 05 @	—
Flasks, old	85 @	—

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward Gardens is a day well spent.

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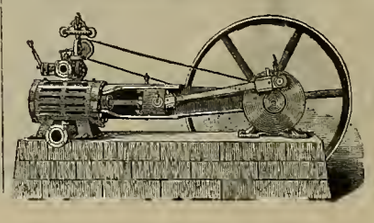

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BY GUIDO KUSTEL,

MINING ENGINEER AND METALLURGIST.

CONCENTRATION OF ORES (of all kinds), including the Chlorination Process for Gold-bearing Sulphurets, Arsenurets, and Gold and Silver Ores generally, with 120 Lithographic Diagrams. 1867.

This work is unequaled by any other published embracing the subjects treated. Its authority is highly esteemed and regarded by its readers; containing, as it does, much essential information to the Miner, Millman, Metallurgist, and other professional workers in ores and minerals, which cannot be found elsewhere in print. It also abounds throughout with facts and instructions rendered valuable by being clearly rendered together and in simple order. It contains 120 diagrams, illustrating machinery, etc., which alone are of the greatest value. PRICE, $7.50.

ROASTING OF GOLD AND SILVER ORES (Second Edition) and the Extraction of their Respective Metals without Quicksilver, 1880.

This rare book on the treatment of gold and silver ore without quicksilver, is liberally illustrated and crammed full of facts. It gives short and concise descriptions of various processes and apparatus employed in this country and in Europe, and the why and wherefore. It contains 156 pages, embracing illustrations of furnaces, supplements and working apparatus. It is a work of great merit, by an author whose reputation is unsurpassed in his specialty. PRICE, $3, coin, postage free.

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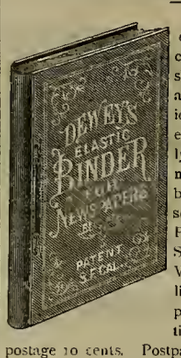

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Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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A. S. DENNIS—San Mateo county.
A. C. KNOX—Sonoma, Lake and Mendocino counties.
C. D. MCDUFFIE—Sacramento county.
JOHN H. STURCKE—Santa Clara county.
B. W. CROWELL—Fresno and Tulare counties.
J. W. RILEY—Stanislaus and Merced counties.
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WM PASCOE.

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.]

FOR WEEK ENDING JULY 1, 1884.

301,204.—PAPER OR LETTER FILE.—Wm. B. Berry, Napa.

301,222.—SULPHUR RELINING APPARATUS.—F. Dickert, Salt Lake City.

301,304.—DREDGING MACHINE.—Wm. Harwood, Oakland.

301,251.—FLOUR BOLT CLEANER.—A. F. Mase, South Vallejo.

301,252.—ALARM LOCK.—A. F. McCollam, Fair Play.

301,254.—DRAG SAW.—McFarlin & Plum, Ono, Cal.

301,384.—AGRICULTURAL IMPLEMENT.—T. H. Meinhard, S. F.

301,149.—MIXED PAINT.—H. C. Petty, Vallejo, Cal.

301,285.—OYSTER CULTURE.—C. Schmitz, S. F.

301,396.—FURNITURE CASTER.—Scolley & Frick, S. F.

301,297.—PLOW.—C. B. Steane, Pleasanton.

15,118.—BADGE DESIGN.—C. H. Scanlan, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise), at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the pateuts recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

ALARM LOCK.—Alexander F. McCollam, Fair Play, Cal. No. 301,252. Dated July 1, 1884. This alarm lock consists, in connection with the reciprocating latch-shank and key of a lock, of a novel arrangement of spring strikers operated hy said shank and key, and of a gong inclosed by the lock casing, against which said strikers operate.

PAPER OR LETTER FILE.—Wm. B. Berry, Napa. No. 301,204. Dated July 1, 1884. This invention relates to a new and useful file for papers, letters, cards, sheet music, and other articles of similar nature which usually lie around in disorder, and are for that reason liable to be lost or injured. It consists of a series of peculiarly arranged spaced spring-brackets, or frames, adapted to he suspended from the wall, and having suitable words or characters indicative of, or referring to, the contents of the brackets.

DRAG SAW.—Wm. M. McFarlin and Chas. Plum, Ono, Shasta Co. The sawing machine consists in a peculiar self-supporting reversible frame, upon which are mounted two wheels, which, when the frame is upright, have the function of cranks for imparting motion, and when the frame is inverted have the function of rolling wheels for transporting the machine. With one of these wheels is connected a pitman, through which a reciprocating motion is imparted to a vertically adjustahle rod having the saw nttached. The arrangement of the different parts, the means hy which the inclination of the saw is varied, and the means hy which it is adapted to saw standing trees as well as logs, form part of the invention. This constitutes a simple and easily handled machine for use in the woods, adapted to saw up falleu trees or to saw down standing ones.

AUTOMATIC FLOUR-BOLT CLEANER.—Albert F. Mase, South Vallejo. No. 301,251. Dated July 1, 1884. This invention relates to that class of devices for cleaning tho rcels of flour-bolts, in which a brush is suspended over and its hristles come in contact with the exterior of the reel; and the invention consists of a novel arrangement and combination of devices. The rcels of flour-bolts are made polygonal, some having six, others eight and others nine or fewer sides, which are composed of fine silk stretched over ribs at the angles or wheel lines: for the pur pose nf preventing wear, ticking strips are secured. When the flour is at all damp, the most of the silk becomes clogged and it is necessary to keep it brushed to permit it to perform its functions. Various means are employed to accomplish this result, among which isan overhanging brush adapted to come in contact with the exterior surface of the silk. In some, the whole weight of the brush rests on the silk and soon wears it out, and in otherst he brush is set at an angle on the silk and nets as a wiper rather than a hrush, the difficulty in this heing that such a brush hecomes itself clogged up as its hristles are not exercised so as to frec themselves hy agitation. The ohject Mr. Mase has in view is to so suspend and connect the hrush that its weight shall at all times be removed from the silk, and yet be so moved that whatever way he the contour of the reel, its hristles shall come in light contact with the silk to hrush it and jump over the ribs to prevent wear of the ticking strips. The means for supporting the hrush, the mechanism for connecting it with the driving power to accomplish its action, the means for throwing it out of gear and the means for preventing undue wear of the gearing all form part of the inventor's patent.

PLOW.—Chas. B. Steane, Pleasanton, Alameda county. No. 301,297. Dated July 1, 1884. This is an improvement on that class of plows adapted for use in vinoyards and other places where rows are planted, where it is necessary to get near the plants or vines without injuring them. The invention consists in a peculiar pivoted beam adapted to be turned in a horizontal plane to an angle with the plow bottom and line of travel, in the peculiarly adjustable handles, and in the means of bracing or supporting them, and in the general counection and relation of the standard, beam and land-side. By bending down and pivoting the rear lower end of the beam the draft is strengthened and steadied, by applying it to both top and bottom of the plow. The standard is not in a vertical plane with the land-side, and consequently the beam is more in the center of the plow. A central draft is gained. Moreover, when plowing near the vine to throw the dirt away from it, some provisiou must he made to avoid injury to the shoot which is left on the stem of the vino and furnishes the next year's growth. This shoot is high enough to nllow the land-side to pass underneath it; hut when the standard is flush with the land-side, it is obvious that both it and the heam would strike the shoot and break it; hut by moving the standard over and out of line with the land-side, both standnrd and heam will pass by the shoot and the land-side will pass under it.

APPARATUS FOR OYSTER CULTURE.—Christopher Schmitz, S. F. No. 301,285. Dated July 1, 1881. This new process and apparatns for oyster culture consists of a combination of devices. The inventor has a novel apparatus consisting of an annular perforated vessel set on a surrounding hasin communicating with canals provided with rocks and rubbish in their hottoms, and a means for supplying a gentle flow of sea water to said perforated vessel. The oysters when near their spawning or "sick" time, are placed in a vessel containing sea water. This time or event is when the two vesicles of the shell-fish which contain the eggs and milk commence to swell until the membrane bursts and fertilization takes place. Soon after this the spat or spawn may he extracted by the operator, or the shell-fish will itself expel them in the course of nature. A very fine stream of water is allowed to pass through a pipe into the vessel. Thence it passes through the perforated sides of said vessel in innumerable small and gentle currents widely spread into a sort of hasin. The young are alive when expelled hy the mother and they float around and pass through the sides of the vessel into the basin. Thence they float gently into canals until they find the stones and rubbish to which they adhere by means of a small tentacle with which they are provided. The first necessity of life of the young oyster is that it shall find something to which to adhere and he ahle to cling to it. If it cannot do this it perishes. This apparatus as a whole conduces to the general result of giving each living young oyster a chance to find its lodgment.

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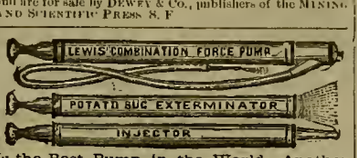

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Day of sale.....August 4, 1884.
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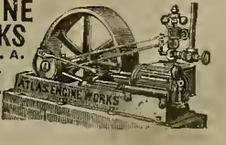

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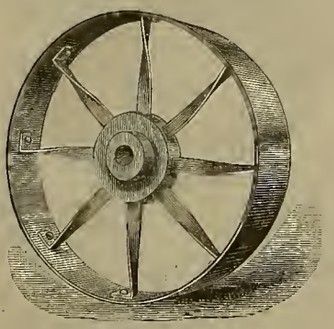

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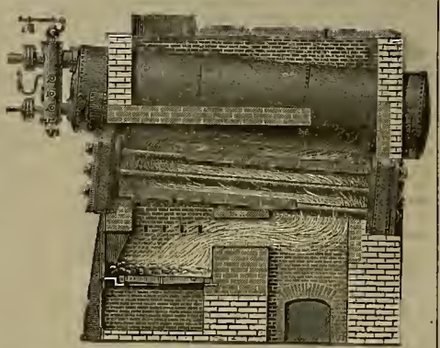

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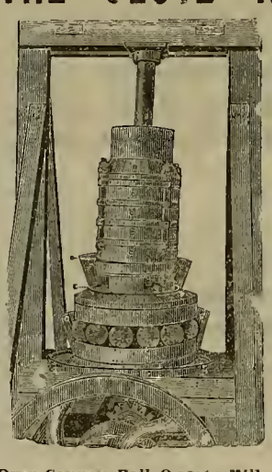

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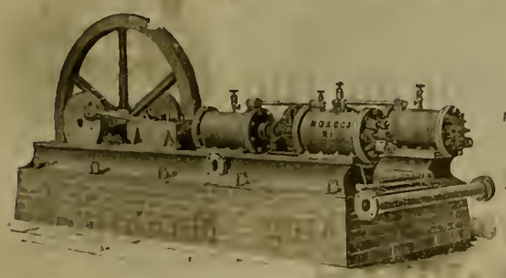

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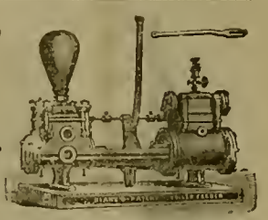

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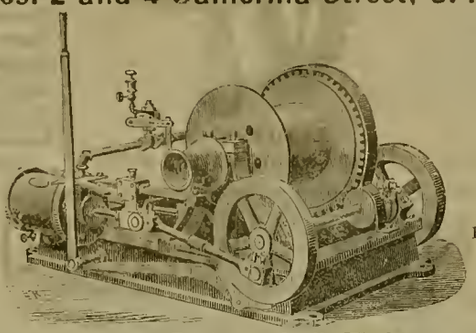

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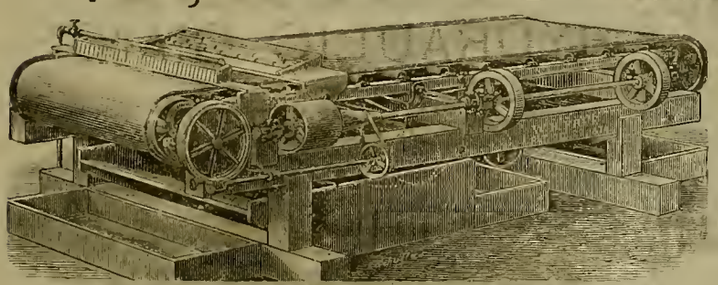

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That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

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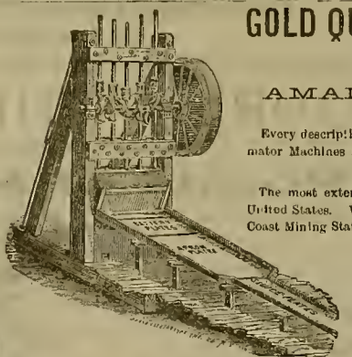

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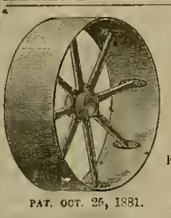

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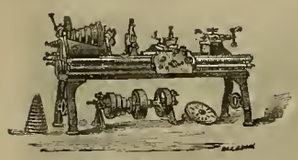
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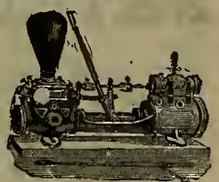
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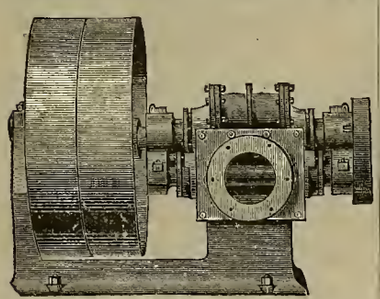

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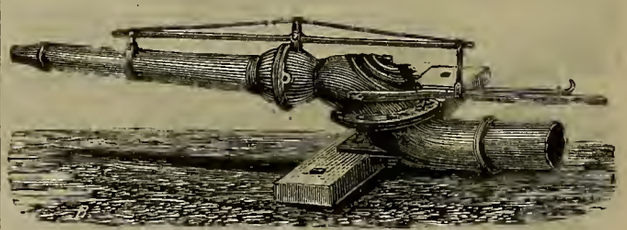

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ECLIPSE DOUBLE TURBINE WATER WHEEL.

Points of Superiority:

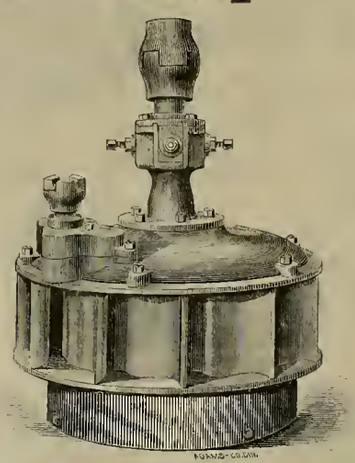
FIRST.—Simplicity, being composed of the smallest possible number of parts.

SECOND.—The Wheel, Outer Case, Register Gate, and Top, each being one casting, and all the work on them being performed by machinery, and fitted to a standard gauge, secures the highest perfection in construction and operation, and the utmost strength.

THIRD.—The entire absence of rods, bolts, levers, light castings, or "traps" of any kind, securing the greatest durability, with entire immunity from derangement of parts and breakage, so common in all complicated wheels.

FOURTH.—The conical interior of the wheel, which secures perfect freedom of vent for both tiers of buckets, enabling the wheel to rid itself immediately of "dead water" without friction. This feature is entirely original with this wheel, and is found to be of very great practical importance.

FIFTH.—Its "Duplex Chute," formed by the Register Gate and outer case. The outer case moulds the current of water, delivering it in a solid body through that part of the Chute comprised in the Register Gate on to the wheel. This Chute being fixed, the direction of the current is never changed, nor its velocity checked, consequently nearly the same per cent. of power is obtained with the gates only partially drawn as when fully open.



SIXTH.—A Gate thoroughly protected from vertical pressure, which, when partially closed, does not break the column of water or change its proper direction, which is easily operated, and yet shuts so tight as to prevent leakage; and the shutting of which is not likely to become obstructed or prevented by foreign substances.

SEVENTH.—The housing up of the pinion and segment for operating the gate, which entirely prevents all danger of breakage by foreign substances getting between the teeth. No other concern does or can use this improvement, which effectually does away with a source of most frequent annoyance and delay.

EIGHTH.—The amount of power it yields, together with its Simplicity, Durability and Strength, fairly entitles our wheel to the name given it, The Eclipse Turbine. In further proof of the power of this wheel, we invite a careful inspection and comparison of our tables with corresponding tables for all other similar wheels.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JULY 19, 1884.

VOLUME XLIX Number 3.

Poison in Food Receptacles.

In the PRESS of last week we gave an account of a discussion on the subject of adulteration of tin by lead, which took place before the California Academy of Sciences. We notice since that this subject is attracting attention at other places. Some Brooklyn people were taken violently sick after eating ice-cream which stood for some time in a copper freezer, the tin lining of which must have been defective, has brought attention again to the danger of poison in food receptacles. Many apparently inexplicable cases of poisoning by ice-cream have been noted, and criminal accusations have been made against innocent persons.

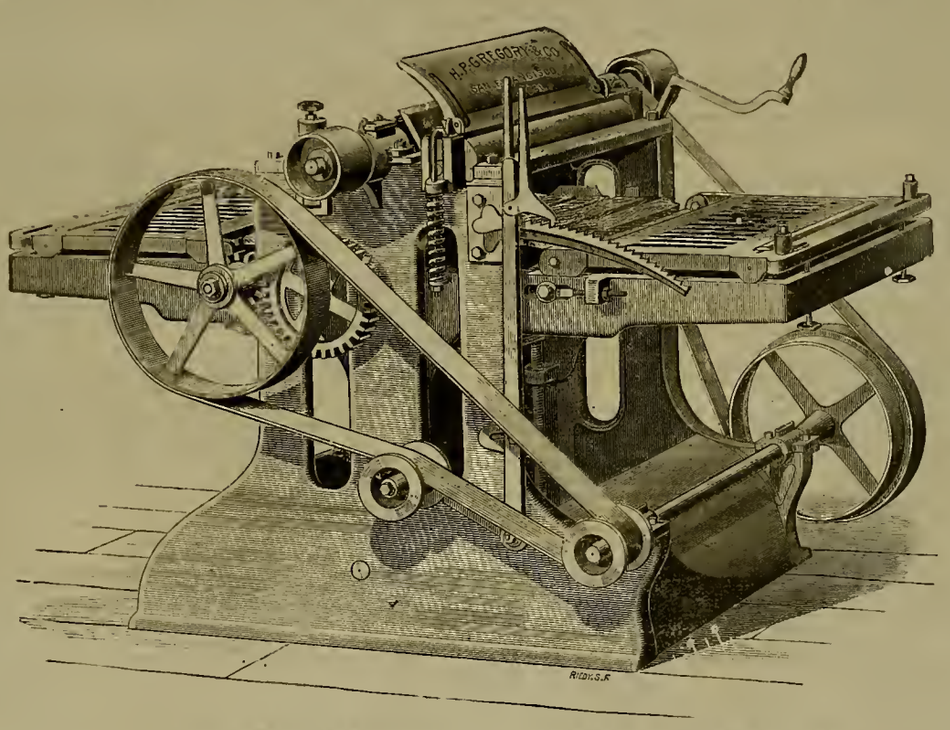
But in the case of canning goods in tin made with a mixture of lead, the community can protect itself. Laws could be easily framed and carried out severely punishing those manufacturers who put up food substances in adulterated tin. The acid of fruits and vegetables acts upon poor tin in such a way that the food contained in the cans may soon become deleterious, if not positively poisonous, and the interest of health and industry involved is so great that packers should avoid the use of any but the best of cans. The use of glass should be encouraged but tin is more convenient and less expensive for the preservation of many kinds of food, and the prohibition of the use of tin of an inferior quality is a proper subject for legislation.

The subject, as well as that of drinking water from lead pipes, should be carefully considered. People buy canned goods because they are convenient and cheap; but they will stop their purchase entirely if it is found there is danger in their use. It behooves the large manufacturers, therefore, to guard against any possibility of accident by using only good tin in making their cans. The dull leadish color of adulterated tin may be readily recognized by those who have ever had an opportunity to compare it with good tin: but not everyone has had that opportunity. Moreover, the sides of most tinned food receptacles are covered with paper labels. With the top and bottom good tin, and the body of the can poor tin and labeled, the public would be deceived. Swift and merited punishment to the makers of adulterated food receptacles or impure food would soon work a cure of the evil.

In the mining suit of Albion *vs.* Richmond at Eureka, Nev., the Albion has amended its complaint and now claims loss through the Richmond Company of 9,208 tons of ore, worth $65 per ton, and $10,000 damages to the mine, making in all $608,520. The Richmond, in its amended complaint, denies the Albion's title to the ground in dispute and avers that not more than 210 tons of ore were taken out of that ground and that the same was worth not to exceed $4 per ton.

The Pacific Feed-Surfacing Machine.

The accompanying illustration represents a new improved endless or traveling-bed planing machine, built by Messrs. H. P. Gregory & Co., Nos. 2 and 4 California street, San Francisco. It is constructed from new patterns, and includes all the newest and latest improvements which experience has shown is required to do good work at a rapid rate of speed. In constructing this machine, weight has formed a vital element, and the makers have aimed to place the material in a scientific manner, and where it is best calculated to withstand the strain in planing heavy timber. The spindle, are of the best quality of cast steel. The slats of the feeding apron and the bearers (of which there are four), are of cold blast iron, made as hard as can be worked.



PACIFIC ENDLESS-BED FEED-SURFACING MACHINE FOR BOARDS OR TIMBER.

The rolls are of refined wrought iron, of extra size, and cannot be broken by use. The cutter head is three-sided, and of that form which experience has demonstrated to be the best for doing work. The cylinder is belted at both ends, and the pulleys are extra large, both in diameter and face. The gearing is strong and will last as long as the machine. All feed belts are open or straight and run on wide pulleys.

The extension tables are of good weight, and are hinged to raise or lower to suit different thicknesses of material, so that clipping the ends of boards can be entirely obviated. The machine planes from the thinnest material to 12" thick. The cylinder may be run from 3,500 to 5,000 revolutions per minute. The arrangements for raising or lowering the main table is simple and easy to operate. One turn of the crank raises or lowers one sixteenth of an inch. Every machine is tested before leaving the works so as to ensure satisfaction. Each machine is provided with a heavy counter shaft, with hangers for floor or to hang from the ceiling as may be desired. Has tight and loose pulleys 12" diameter 8" face, and should run 1,000 revolutions. Weight 3,500 lbs.

Two miners were killed and others wounded by an explosion in the Syndicate mine, Bodie, recently. A number of miners were passing through drift No. 2 at the time of going on shift, when it seems that the above named were in close proximity to each other. Renaud carried giant cartridges in his hip pocket, and was walking in advance of Wright and Smithem, following in the rear. He (Smithem) carried some giant cartridges in his right hand jumper pocket, and in the left pocket were some fuse cut in short lengths, and capped ready for use. In his right hand he carried a candle, while the arm supported a pick and picker—a tool used in place of a drill in soft ground—and the most probable theory is, that the bunch of fuse with capped ends were sticking out of the pocket, and came in contact with the candle, exploding the caps and firing the giant.

NEVADA ANTIMONY MINES.—John P. Finley, a mining expert, is at Battle Mountain looking at some prospects with a view of purchasing. He represents the American Antimony Company, which has large antimony reduction works in Boston, Massachusetts, and several other Eastern cities.

THE nitre deposits of Churchill county, Nev. are claimed by B. F. Dobe, F. C. Leavitt, M. Southard, C. H. Mason and others.

Mine Ventilation.

A treatise "On Practical and Theoretical Mine Ventilation," by Eugene B. Wilson, instructor in Drifton Industrial School for Miners and Mechanics, has just been issued by John Wiley & Sons, New York. The work comprises about 130 pages. The author, aware of the interest manifested by miners in the subject of mine ventilation, which is so intimately connected with their daily employment, has endeavored to deal with ventilation in such a manner that no one with a fair knowledge of the English language and of arithmetic need dispair of mastering it. He has endeavored to do away with abstruse language and such highly mathematical formulas as are only calculated for well educated engineers. Each article is illustrated by an example. There are many practical hints given for engineers; but the book is mainly intended for miners, not for engineers. From the chapter on "laws affecting air in mines," the following paragraphs are taken. The laws affecting the circulation of air through mines or confined passages such as gangways, have been ascertained principally by such men as Magnus, Regnault, Gay-Lussac, Daubisson, Peclet and others, and are as follows: "The volume assumed by a given weight of air is inversely proportional to the pressure on each unit of surface under which it exists, so long as the temperature remains unaltered. Consequently, if we take a cubic foot of air under the pressure of five pounds, it will only be one-half a cubic foot under a pressure of ten pounds, and one-third of a cubic foot under a pressure of fifteen pounds. When the pressure is constant, the volume is uniformly in the ratio of 1-459 part for each additional degree of heat, Fahr.

When air is discharged through orifices offering no sensible frictional resistance, the result is sixty-five per cent of the quantity due to the velocity multiplied by the area in case of a thin plate; ninety-three per cent in case of a short cylindrical tube; and ninety-five per cent when the tube is conical, and the area taken from the small end. This contraction of the flowing air, which is similar to that which takes place when water is discharged through pipes under the same conditions, has the effect of reducing the quantity discharged in a given time below that which would be due to the velocity, if it existed, over an area equal to that of the orifice or tube. This contraction of the flowing air is termed the "vena contracta."

When air is impelled through a confined passage, the pressure or head of air-column required for its propulsion is proportional *to the square of the velocity*; so that to double this velocity there must be four times the head; to treble it, nine times the head; etc.

THE Leadville concentrating works of Estey and Hall were destroyed by fire this week.

An Immense Tin Deposit.

If the reports of the recent discoveries of tin at the Black Hills, in Dakota, are of a reliable character, as they certainly appear to be, the United States is destined to become the leading tin producer of the world.

The world's production of this metal last year amounted to 15,770 tons, about one-third of which was consumed in the United States. The countries which produce tin are those bordering on the straits of Malacca, in the East Indies, Australia and the Cornwall district in England. All the tin consumed in this country has been imported almost wholly from England and English colonies, but the recent discovery in the Black Hills will, if the statements made are correct, revolutionize the trade. According to Professor Bailey, the deposits there are so vast as to be able to supply the whole world for centuries.

The center of the district which covers an area of twelve miles by seven or eight, is Harney Peak. The tin-bearing rock can be quarried from the surface instead of being followed underground and he claims to have seen veins of it of more than fifty feet in width which will average much better than the Cornish veins, where the ore has to be raised from a great depth at a heavy cost. Of the stream tin which can be obtained by sluicing and which will yield about fifty per cent of pure tin, he speaks as follows:

"The stream tin alone is so abundant that all the companies that could possibly work it could go on for 20 years without exhausting it. Yet this is but the waste, you might say, of the main deposit—the mere scraps that water and frost have detached, a little bit at a time from the great mass and source of the ore, which is Harney Peak, itself, more than a mile high, and the surrounding tin-bearing rock, which, as I have already said, extends for miles. It is impossible to imagine this great body of ore ever being exhausted. As to profit, the richness of the ore compared with that of any other tin-bearing district of the world settles that conclusively."

The First Discovery

Of this deposit was made in the Etta mine, in Harney range, about the first of June, 1883, since which time discovery has been made at several localities of tin stone, the most important being that of Nigger Hill. Mr. Chapman, one of the owners of this mine, furnishes the following facts to a correspondent of the *Mining Review:*

The mineral was first noticed by Mr. Box, who, upon being shown a piece of heavy black rock taken from the gravel of the creek, announced the fact that it was tin. Search was at once instituted for the ledge which had afforded such an abundance of the ore in the shape of stream tin, and which had been the hane of the miners ever since placer mining had been inaugurated in the gulch, its high specific gravity rendering it almost impossible to save fine gold in sluicing or washing without amalgamation. The stream tin is found usually as sand or small pebbles, though larger pieces have been found. One piece exhibited by Mr. Chapman weighs seventy-two ounces. The search for the ledge resulted in the discovery of a large vein, averaging over 100 feet in width, which has been traced for a distance of four miles. The inclosing rock of all the ore I have seen is orthoclase, the cassiterite being scattered irregularly through the mass in minute grains and crystals of considerable size. The country rock, through which the vein passes, from the description of Mr. Chapman I should judge to be a syenitic gneiss.

A large number of claims have been located on the vein, prominent among which are the Michigan, Lily, Rough and Ready and Giant. A curious fact has been demonstrated on one portion of the lead; the tin-bearing rock comes to an abrupt termination and its place is taken by gold-bearing quartz, which continues for about 500 feet, when the tin ore as suddenly makes its reappearance, and as far as is known, continues uninterruptedly. A shaft has been sunk to a depth of thirty feet on the gold-bearing portion of the ledge, which prospects well. A tunnel which was run to tap the vein on the Giant, after being driven a distance of 250 feet and cutting several seams of ore—all of which, I believe, carry tin—encountered a vein, into which the tunnel has been extended 100 feet, the face still being in ore carrying tin.

The miners have made rude tests of their rock by pulverizing and concentrating by washing; the concentrated ore then being smelted in a blacksmith's forge, the results invariably being good. In one instance, 40 pounds of rock was reduced to 10 pounds, and a bar of metallic tin, weighing one pound, smelted from it. The process being rude, was necessarily very imperfect; as cassiterite carries about 78 per cent of tin, the result should certainly have been more than 25 per cent. The main chain of mountains, constituting the axis of the uplift of the Black Hills, has a general trend northwesterly and southeasterly, and as the tin mines of Nigger Hill are located near the northern extremity of these mountains, and the mines of Harney near the southern end, it is reasonable to expect that other tin veins will be discovered along this range; indeed tin has been discovered several miles north of Harney. Considerable development may be looked for in these mines during the coming summer.

Productive Montana Mines.

In an article on the mines of Butte, Montana, the Butte *Inter-Mountain* says:—Very few people who live in Butte understand the extent of its production as compared with that of other mineral sections of the great west. This district embracing an area of mineral bearing ground scarcely three miles square, is producing silver and copper at the rate of a million and a quarter of dollars per month. The total production during the first quarter of the current year was upwards of $3,000,000, figuring copper at 13 cents and silver at 105. Since then freight statistics show an increase of fully one-fourth in the outgoing tonnage, the shipping product of the Anaconda alone having been increased from 2,500 to 5,000 tons per month. Therefore $1,250,000 is a safe and conservative estimate of the monthly product of the Butte district. It is more than the combined gold and silver product of the state of California. It exceeds the entire output of Nevada. It is at least a fourth greater than Utah. It equals the monthly yield of all the mines in Arizona. It is more than aggregate the production of New Mexico and Idaho. Leaving the camp of Leadville out of consideration, it is more than the combined production of all the famous mining counties of Colorado. It is equal to the production of Leadville itself which was $18,000,000 last year, but which will be less than $15,000,000 for 1884 according to the present output and the ruling price of lead. Next year the production of Butte will far exceed that of Leadville, for while the yield of our Butte mines is constantly increasing that of the once noted blanket veins of the great carbonate camp is gradually but surely diminishing.

It thus appears that after a struggle lasting through five years of vicissitude and three years of increasing prosperity, the camp of Butte has advanced to the first position among the mineral producing districts of the United States and of the world. There are no reasons why it should not. There are many reasons why it should. The advance, when once begun, was rapid. In 1880, the total production of the district was $1,428,088.26; in 1881, it was $4,075,150.70; in 1882, it was $6,200,000; in 1883, it was $9,027,843.54; during the current year will be not less than $15,000,000, estimated on returns for last quarter, which will make a total for the five years of $35,731,082.50, as being Butte's contribution to the material wealth of the world during the time specified. How many mining and business men of Butte ever took the trouble to figure up the total output? To those who have not what a revelation are the above figures?

That Butte is now the leading producer among the mineral districts of the world should not be a matter of surprise. The claim is based on the simple fact that it contains the biggest mines in the world. They have ceased to be prospects. Their present output is tangible evidence of their wealth and their future has been by recent development removed beyond the pale of doubt. Let us take a look at the situation:

The Copper Interests.

The Anaconda, with the finest equipment of any mine on the Pacific coast, is down 800 feet. The extraction of ore is proceeding from 14 faces. On the lowest level the ledge is 40 feet wide, strong and well defined. Over 200,000 tons of copper ore, which in any other country would be deemed high-grade, are on the dump. The daily product of shipping ore alone is 160 tons. In the valley the company is erecting the largest copper smelter in existence. Nearly 800 men are on the pay-roll. Last year it sold nearly $2,000,000 worth of copper, and will beat the record hollow this year. The hoisting capacity of the Anaconda machinery is as great as that of any on the Comstock, not excepting that of the Con. Virginia. The policy of the company at present is one of reticence and conservatism, hence the absence of detailed information as to the present workings.

The Colusa is another great property. Its shaft is 400 feet deep: its productive capacity 200 tons per day; its output, every pound the smelter can treat with six furnaces. Above the 260-foot level it has enough ore in sight to supply the works for two years. Its crude and smelted product last year realized over $2,000,000. It is a regular dividend payer.

The Parrot ranks third among our great producers. It supplies a smelter containing six furnaces, and so great is its developed productive capacity that the erection of a new smelter, of the same capacity of the old one, though on a different plan, is in contemplation. The Parrot is a regular dividend payer.

The Colorado smelter is also doing a great work. Supplied chiefly by the Gagnon, a mine of almost inexhaustible productiveness, it also treats large amounts of custom ores and is producing over $1,000,000 per year, principally in silver. It is a regular dividend payer.

The Bell, on the 400 foot level, has developed a bonanza and supplies 30 tons of high grade silver-copper ore per day, which is reduced by blast furnace. The vein is strong and well defined and varies in width from 6 to 23 feet. The ore, of which vast quantities are available for extraction, carries more silver than any other copper ore in the district. A new shaft has recently been sunk on the property which is now in good shape for deep exploration.

In addition to the mines mentioned above, whose owners operate smelters in connection therewith, are the Clear Grit, a mine in process of active and skillful development. It has a good record and shows an extensive ore body enclosed by walls well defined and with a regularity of dip and strike which indicates an enduring future. The shaft is now going to the 320 foot station, and when the mine shall be opened from that point a concentrator and smelter will be erected. They are fully justified even by the present appearance of the mine.

The Mountain View, now developed to the 500 foot level, is destined to rank with the great copper producers of the district. In width of vein it has no superior, and it has all the characteristics of the Anaconda, of which it is an extension. C. X. Larabie owns the property and superintends its development.

Clark's Colusa is another productive property without a smelter attachment. It is producing daily 75 tons of copper ore from the 100 and 200 foot levels, and the shaft is being dropped to the 300 foot station with all possible expedition.

Still another important copper mine is the Liquidator, whose product averages 100 tons per day. Of this, nearly one-half is shipped to Swansea, the remainder being dumped for future treatment.

Ramsdell's Parrot is another mine capable of a heavy production, but it is not being worked on a large scale.

The Silver Interests.

The silver interests of Butte are scarcely less important than the copper interests, though they employ fewer men and are believed to be less profitable. They are low grade mines, but they are extensive, permanent, accessible, uniform in dip and strike, not hard to work, and with capital, economy and intelligence, are all susceptible of profitable development. They are big company mines.

The Lexington is the leading silver mine in the Territory. Last year it produced $1,289,685 34. Its monthly yield now varies from $95,000 to $100,000. The shaft is 500 feet deep, and the vein, which has always been remarkable for the uniform richness of its ores, shows up better on the lower level than in any of the upper workings. The Lexington mill is among the most perfect structures of its kind on the continent. It treats daily 50 tons of ore. The Lexington is a regular dividend payer. Last year it paid over $200,000. This year it has already declared a dividend of $80,000, and another one will shortly be forthcoming. Up to June 1st the Lexington produced $514,092 since the 1st of January.

The Moulton is also enrolled among the list of Butte's dividend paying mines, the company having just declared a $400,000 dividend and having a reserve fund of over $100,000. It is one of the best managed mines in the district. Two years ago, owing to the ill-advised action of the Bowers sindicate, the property was in debt almost as much as the Alice, but a policy of rigid economy has entirely dissipated this burden, and the company is now free from all encumbrance and is clearing a handsome profit on a comparatively low-grade ore. Operations are chiefly confined to the 2d, 3d and 4th levels, from which about 40 tons of ore are daily extracted. The bullion product averages from $50,000 to $55,000 per month. Up to June 1st the Moulton produced $261,250 since the 1st of January.

The Alice maintains its usual production and is credited with an output this year of $520,843 up to June 1st. The bulk of the ore from the Alice is now coming out of the south vein, whose product, added to that of the Magna Charta, makes between 90 and 100 tons of ore daily treated in the two mills of the company. The Alice has just paid a quarterly dividend of $50,000, but we regret to say that the company is about $200,000 in debt, which should be paid off before the declaration of any further dividends. It is stated that arrangements have recently been made for the liquidation of the indebtedness by small payments, made at the company's option, covering a period of four years. Walker Brothers say they will only charge 4 per cent. The Alice is a big institution, employing over 300 men and contributing to the output of the camp over $1,000,000 per annum.

Among other important silver mines of the district, whose owners have no mill in which to work their ore, are the Poser, producing daily 20 tons, which is being treated in the Silver Bow 30-stamp mill; and the Orphan Girl, producing daily 30 tons, which is being treated in the Dexter 15-stamp mill. The Bonanza, the Stevens, the Blue Bird, Auraria, the Amy-Silversmith, the Original, the Maria and a score of lesser properties are being actively developed and producing well.

This brief review of the names, output and development of Butte's leading copper and silver properties may suffice to show the ground upon which is based the claim that this is the leading mining district of the United States, and of the world. The railroad shipments to and from the camp are alone sufficient evidence of its greatness. According to the statistics of the first six months of the current year the incoming and outgoing freight will aggregate 250,000,000 pounds, of which the ore and matte shipments will amount to at least 100,000,000 pounds, or 50,000 tons.

Treating Rebellious Ores.

The vast importance of some successful process of treating rebellious ore gives every experiment in this direction unusual interest, and every operation is eagerly scrutinized by practical and scientific men whenever presented. For some months Prof. Cherry, of Chicago, associated with a number of prominent capitalists, has been experimenting upon a system which he has invented for this particular purpose. During the present week an experimental run was made with some most rebellious and refractory ore, and the result, we are pleased to note, indicates a decided success. To better understand the process and method employed, we will give a brief synopsis of the operation as detailed by Prof. Cherry.

The furnace was charged with about 2½ tons of ore, which was particularly sulphurous and arsenical in its composition, the reduction of which has been unsuccessfully attempted at a number of different places. The apparatus used at present is an upright retort, with a capacity of from 2½ to 3 tons. The ore is broken to the size of a hickory nut or finer if required. The retort after charging is sealed so that air is excluded and the ore is treated in a vacuum.

Heat is then applied to the outside of the retort until a temperature of about 560 degrees is secured, indicated by a pyrometer inserted in the top of the retort. When this degree of heat has been attained, superheated steam is forced into the retort, under a pressure of from 15 to 25 lbs., and uniformly distributed through the entire mass. The steam in the retort and the heat outside is continued until from 600 to 630 degrees of heat are shown, when a considerable part of the sulphur will be thrown over and deposited as flour sulphur in a vessel for condensation and precipitation. The current of superheated steam is permitted to pass through the ore in the retort and to escape through a pipe provided with a check valve, by which can be regulated the pressure in the retort and the exit of the liberated sulphur which is carried over by the hydrogen in the steam, while the oxygen is taken up by the ore. This process is continued until the vapor and steam escaping fail to show any odor of sulphur, when, if the progress has been properly conducted, it will be found that all the arsenic and sulphur will be entirely separated from the ore and deposited as solids in the form of flour sulphur and chloride of arsenic, which product may be utilized.

To further carry out the intent of this deoxidizing and desulphurizing process, and to liberate the minerals under treatment from their inorganic constituents with which they are combined in nature as amorphous metalloids, and to free them from their associations, a current of super-heated air is at this point introduced under a pressure of 20 pounds, through the same apparatus through which the steam was injected, and forced through the mass of ore in the retort. "It is well known," Professor Cherry says, "in metallurgy, that there are three or more kinds of amorphous sulphur, also phosphorus, in most of the metalloids. The amorphous constituents, contained in these ores, cannot all be volatilized and carried over by the steam, so, in order to most thoroughly remove them, it is necessary to apply a current of super-heated air. The oxygen of the air combines with the metalloids in their nascent condition, which produces a union or combination which effectually secures the separation desired." This current of air is also made use of to replenish the partially treated ore with organic oxygen, and may be continued until the ore is thoroughly oxidized.

It is evident that all sulphuret, arsenical and rebellious ore, may be satisfactorily treated by this process. It may be noted also that the heat required being only about 600 degrees, insures against loss by volatilization, as there are few of the metallic compounds fusible at this degree of heat. In the treatment of iron ores the utmost satisfaction has been obtained, and it is stated that the metal secured has large magnetic properties, which give an important value.—*Chicago Mining Review.*

GOLD, SILVER AND NICKEL.—Miners from several camps in the western part of the county who came here to celebrate the Fourth of July, brought samples of the ores in which they are working, in with them. Three parties of them met by accident at the *Silver State* office. L. F. Dunn, from Spring Valley, had a piece of gold-bearing quartz worth two-thirds of its weight in gold, which he found in one of his mines in Spring Valley. Wm. Woolcock, J. C. Harris and Jack Phillips had a box of silver ore from the Grizzly mine, in Star district, that assays $2,500 to the ton. It was taken out of the lead about 200 feet below the surface, and there is plenty of it. Some of the chunks of ore will be sent to Col. Thomas, of Sutro, for exhibition at the New Orleans exposition. The ore is mainly black sulphurets of silver, liberally sprinkled with flakes of native silver. Gregg Olsen and P. M. O'Brien brought chunks of nickel ore from the Lovelock mines near Cottonwood canyon, which assay from forty to sixty per cent metal. This ore was taken out of a four-foot vein some forty feet below the surface. These are only a few of the many metals and minerals which abound in our mountains and valleys, and which sooner or later will be worked. There are extensive copper, lead, and antimony mines, as well as gold, silver and nickel in Humboldt, besides salt, borax, sulphur and niter.—*Silver State.*

MECHANICAL PROGRESS.

Troublesome Boiler Settings.

The *Locomotive*, in a recent issue, directs attention to what it terms "relics of barbarism" in the form of flues running over the tops of boiler shells. "One would naturally suppose," says our contemporary, "that when the number of boilers that have been ruined, and the still greater number that have been seriously injured, by this form of setting is taken into account, no one would think of setting new boilers in this manner. Yet it is done every day, and by intelligent and experienced men, too. The argument used in its favor, that the passage of the hot gases over the steam space superheats the steam, and thereby renders it more economical, is a plausible one, and doubtless leads many steam users to adopt this form of setting; but if the circumstances are carefully examined the argument will be seen to be fallacious. It will be impossible to superheat steam when it is in intimate contact with such a large surface and body of water as it is in the case of a tubular boiler. Moreover, it will be difficult for any one who has in mind the poor conductivity of ashes, to see (when looking into one of these flues after it has been running a few months) how superheating of the steam can occur. Our experience with this form of setting (and it is a somewhat extensive one) points to this: So long as the brickwork at the sides of the boiler is perfectly intact, so as to compel all the gases of combustion to pass through the tubes before they reach the top of the boiler, and the water is good, the influence of the flue is *nil*, because if the boiler is properly proportioned the temperature in the flue cannot much exceed that of the steam in the boiler, and if the boiler is badly proportioned the deposit of ashes which soon collects on top of the shell protects it in a great measure, and this very protection is sufficient to prevent any superheating of the steam. But as soon as the side walls begin to heave, as they almost always do, and crowd away from the boiler shell, then the fire takes a short cut up past the side of the boiler into the flue, the draft is sufficient to carry away the ashes at the points where the openings are, and the exposed portion of the shell gets 'scorched.' Sometimes when the feed water is very acid, the overheating, while hardly violent enough to burn the plates, is just sufficient to bake all scum on the surface of the water on to the shell above the water line, beneath which coating corrosion goes on with surprising rapidity. We have seen boilers set in this way, with a coating several inches thick above the water line, after they had run only a year, beneath which the plates were eaten nearly half-way through, while other boilers in the same room had been running under the same circumstances, with the single exception that the flue did not pass back over the shell, for upward of 15 years, and only showed very slight traces of this action. This seems to us to be conclusive evidence of the injurious action of this form of setting, aside from the liability at any time of the side walls becoming so badly disarranged that actual overheating and fracture therefrom may occur."

American vs. English Tools.

The *Mechanical World* (London), in its issue of May 8th, pays a high compliment to the tools used in every mechanical trade in America, and also to our wood-working machinery. It says:

"The severe competition existing at the present time in the various mechanical trades causes manufacturers to look around and carefully consider every detail to detect where a saving may be effected. In this search we are disposed to assist them by suggesting the use of new and better tools. In too many works the proprietor appears to think that a machine will last forever, so long as it does not break down. We know tools, or rather machines, that have been at work 30, 40, and even 50 years, in certain old-fashioned works, regardless of the fact that newer machines are in the market which will do the work cheaper, better and quicker. We believe it pays a firm to pull out its old machinery and replace it directly there is better in the market. New applications of machinery require to be introduced. Wherever it is possible we are apt to follow in the old ruts. For instance, how few foundries employ sand-sifting machinery instead of the old-fashioned hand sieve, in which each molder sifts for himself.

America is considered the country most fertile in striking out new departures in the use of machinery. The sewing machine, and the applications of machinery to the manufacture of watches and clocks, are instances. Wood-working machinery is another case in which our American cousins have shown us how to use new machinery, besides which may be mentioned the machinery used for loading and unloading wheat in the huge elevators of the States, and which we have been half-heartedly copying the last few years. There appears to be a unanimity of opinion as to the superiority of the tools used in every mechanical trade in America, their great perfection, their adaptability to the daily changing needs of commerce, the saving of hand labor they insure, and the consequent economy in the price of production. It is true, says our London cotemporary, we are awakening to this fact, and are copying them in a great measure. But what is required is bolder action in the adoption of new machines directly they are in the market. In America, towns enter into a new trade with a zest of which we have no idea on this side of the Atlantic. M. Lourdelot, the Commissioner sent to America by the French Minister of Commerce to report upon the trade of the United States, says American intelligence has introduced improvements into the machinery used. Applications of machinery have been made in upholstery, cabinet making, silk weaving, bronze founding, jewelry and artificial flower making—trades which are founded upon European models, but are developed by improvements in tools and the use of new machinery. M. Lourdelot considers the great element of competitive danger in America with Europe arises from the superiority of the tools and machinery used, and the close watching of details too often neglected in Europe. Again, Norway furnishes us with another instance in which superior machinery enables that country to export in vast quantities their ready made doors and windows. The keen struggle for commercial success must force this question of new tools and new machinery upon us, and those who enter into the reality or this fact soonest will prosper best. With the disuse of old-fashioned tools will follow old-fashioned ways, methods and prejudices unsuited for this stirring age when orders are given by telegraph and telephone, and almost required by return of post.

Defective Iron Castings.

It is stated in the English papers that an examination of the broken girders of the fallen railway bridge at Denmark Hill showed that one of them was "honey-combed with air bubbles:" and it is assumed that, as this girder gave way, the extra weight thus thrown upon the others caused the accident. It is almost unnecessary to say, a correspondent in *Iron* says, that the so-called "air bubbles" are really hydrogen cells, and that the only explanation that has been (and probably ever will be) afforded of the source of this hydrogen is, that if not exclusively, it is mainly derived from the moisture of the atmospheric blast, which becomes decomposed on coming in contact with molten iron or steel, its hydrogen being thereupon absorbed by the metal. This occurs not only in the steel converter, but also in the blast furnace and in the remelting cupola. As a consequence, both steel and iron castings are unreliable, and a constant source of danger wherever their soundness is essential to safety; and they are accordingly unfitted for a number of important purposes for which forged metal, at a far higher cost, is considered necessary.

"I do not propose," adds Mr. Fryer, "to refer to any of the various methods and expedients which have been devised, and which are sometimes employed to cure the evil. It will, however, seem remarkable that no attempt has yet been made to get rid of the defect itself by eliminating the moisture from the blast, and thus removing the cause. One practical trial in that direction would go further to solve the whole question than all the theories that have been advanced, and all the laboratory experiments that have been tried since Dr. Muller's famous discovery of the real nature of the so-called 'air bubbles' or 'blowholes.'"

CHILLED CAST IRON ROLLERS.—Chilled iron is a form of cast iron with a surface as hard as flint. When molten iron is poured into moulds which are made of good heat-conducting material, such as iron, steel, &c., then the surface of the cast which comes into direct contact with the mould, forms an exceedingly hard layer. This is due to the fact that on account of the rapid cooling, the carbon does not separate as graphite, but remains chemically incorporated with the surface of the cast. Such products we know as chilled iron.

The rollers for mills are cast in drilled cast iron cylinders, and are therefore chilled on their entire surface, which hardness decreases towards their center, and as a consequence they can be hollowed with ease. Theoretically the manufacture of chilled iron appears exceedingly simple, practically it presents many difficulties, depending largely upon the chemical composition and proportion of iron, of the temperature and thickness of the walls of the mould and many other conditions.

The exceedingly small amount of wear of the surface of the best chilled rollers, recommends their use very strongly for milling purposes as compared with stones. In smooth rollers this wear is almost nothing, and even in grooved sills it requires many months also years before any sharpening is necessary.

A FRENCH writer on the subject of belts, as compared with toothed gearing, says: "In regard to the relative friction with belts or cords, and with toothed gearing, it is that theoretically the advantage is always, more or less, on the side of belts or cords; while a practical confirmation of this conclusion is furnished by the instance of a spinning mill, in which toothed gearing driving 18,000 was replaced by belts, with a saving of twenty per cent. in friction, or 31.2 per cent. on the effective driving power transmitted, and in no case do belts practically cause more friction than toothed gearing."

CAST IRON may be hardened as follows: Heat the iron to a cherry red, then sprinkle on it cyanido of potassium and heat to a little above red, then dip. The end of a rod that has been treated in this way could not be cut with a file. Upon breaking off a piece about half an inch long it was found that the hardening had penetrated to the interior, upon which the file made no more impression than upon the surface.

SCIENTIFIC PROGRESS.

What Makes Ice White and Opaque.

It is a law of light that in passing from one substance to another possessing a different power of refraction a portion of it is always reflected. Hence when light falls upon a transparent solid mixed with air, at each passage of the light from the air to the solid and from the solid to the air a portion of it is reflected; and in the case of a powder this reflection occurs so frequently that the passage of the light is practically cut off. Thus, from the mixture of two perfectly transparently substances we obtain an opaque one: from the intimate mixture of air and water we obtain foam: clouds and snow owe their opacity to the same principle: as also does the whiteness of crushed diamonds, salt, glass, and many other substances which are tranparent before the pressure is applied to them. Ice being, therefore, opaque and white in proportion to the amount of air it contains at the time of crystallization, it follows as a matter of course that anything which tends to expel the air from the water before it is frozen will contribute to its transparency when it assumes the solid state. If, for instance, water be boiled and kept from taking up air from the atmosphere while being cooled to 32 degrees, the result will be perfect transparency in the ice thus formed, whether the process of freezing be slow or rapid. The reason for this is that no air can exist in water in a boiling state. The same is true of perfectly filtered water similarly protected from the atmosphere. In case of ordinary water, which always contains a certain amount of fixed air, the ice made from it will depend for its color on the temperature under which it is frozen; and as this varies, neither ponds or rivers produce ice of anything like uniformity in this respect. Every ice dealer is aware that river ice, as a rule, is clearer and brighter than that of ponds or lakes; the reason being that the current in the river aids the crystallizing force to expel the air, which in still water, especially in very cold weather, is caught up and imbedded in the ice, thus affecting its color and, to a slight degree also, its density and durability. Against these advantages in favor of running streams we must put the larger yields in ponds, the lesser liability to damage from sewage, storms, and freshets, and though last not least, the increased quantity of oxygen and carbonic acid which make ice on ponds both more palatable and digestible than that of running streams.

Scientific Ingenuity.

An interesting little piece of chemical practice is to be found in the process for the removal of the stains upon the Liebig statue at Munich. The statue, which was set in place less than a year ago, is of marble, and its beautiful color tempted some dirty rascal to try and spoil it. For this purpose a liquid containing in solution permanganate of potash and nitrate of silver, two of the substances which produce the most ineffaceable stains upon cloth, was squirted with a syringe over the statute, covering it with black spots, which penetrated deeply into the soft stone. As soon as the injury was observed, competent chemists were set at work to devise means for repairing it. An analysis of scrapings from the surface of the stained marble showed the presence of silver and manganese, and the form in which they were employed was readily guessed, since the nitrate of one and the sodium salt of the other are the only soluble compounds of them in common use. "The nature of the stains being discovered," says the *American Architect*, "it was necessary to invent a method of converting the substances which constituted them into others which could be removed from the stone, and the experts resolved to attempt their transformation into sulphides, with a view to their subsequent solution and removal by the aid of cyanide of potassium. In order to secure the continuous application of sulphur necessary for the complete conversion of the spots, fire-clay saturated with sulphide of ammonium was plastered over them and renewed at intervals until the action was was complete. The paste was then removed, and the marble washed with pure water until all the alkaline sulphides were removed. Another fire-clay paste, saturated with a solution of cyanide of potassium, was then prepared and applied to the spots in the same way as the first. The sulphides formed in the marble were dissolved by the new reagent and the solution absorbed by the clay, and on the final removal of the paste the spots were found to be perfectly removed."

A NEW SCHEME FOR REACHING THE POLE.—We learn from *Nature*, of June 12th, that a new scheme of a polar expedition has been recently submitted by several officers of the Russian navy to the minister, Admiral Shestakoff. Starting from the idea that it is impossible to reach the north pole by sea on account of the archipelagoes that cover the circumpolar region, the Russian officers propose to start an expedition on sledges from the New Siberia Islands, which are nine hundred nautical miles distant from the pole. This space is to be covered by sledge-parties, who would make depots of povisions on the newly-discovered islands, and thus slowly but surely advance towards the north, securing at the same time the return journey of the expedition. When elaborated, the scheme will be submitted to the learned societies, and the necessary money raised by subscriptions.

A Smoke Stream

Mr. Sereno E. Bishop of Honolulu has added sixteen pages to the Krakatoa literature in a little paper on the 'equatorial' smoke stream from Krakatoa, in which he wishes to call more especial attention to a phenomenon consequent on the great eruption, that he thinks has not received sufficient notice. This is the "swift, strong fling from the eruptive column of Krakatoa of a vast stream of smoke, due west with great precision along a narrow equatorial belt at an enormous velocity, nearly around the globe." Commenting upon the above *Science* says: If the facts as here stated are fully confirmed, there will certainly be a remarkably rapid westward propagation of sunset effects to be explained; but the method of explanation suggested by Mr. Bishop is very unsatisfactory in assuming a limit to the atmosphere at forty-five miles altitude. Beginning with this unwarranted assumption, the author supposes that the volcanic gases, vapors, and finest dust would form a flat, conical accumulation over the point of eruption and above the atmosphere. Down the slopes of this flat cone, the gases would slide with accelerated velocity, but chiefly to the westward on account of lagging behind the meridian of eruption (the lagging is given as twenty-six miles an hour at an elevation of a hundred miles, but should be fifty-two miles an hour); and thus the rapid westward propagation of the sunsets can be accounted for. There can be no question as to the tendency to action somewhat in the manner here suggested; but whether this tendency will be fully realized is very questionable, unless decidedly greater elevations than a hundred miles were reached. The presence of some thin remnant of an atmosphere, even above a hundred miles, is demanded by observations on meteorites; and the condensation of volcanic vapors at that altitude would be very rapid. The neglect of these facts is a serious weakness in Mr. Bishop's theory.

FILTERING DISTILLED WATER.—Eiselt recommends the use of sponge for filtering distilled water. The filtration goes on with great rapidity, and the product is clear as crystal. When filtered through paper, distilled water soon exhibits a *felty* sediment, which is never formed when filtered through sponge, so that the bottles scarcely need cleaning after several months' use. The apparatus that he employs consists of a bottle with an opening near the bottom from which descends a bent glass tube. This tube is about 6 inches long and 1 or 1½ inches in diameter; at each end is a perforated rubber stopper bearing a narrower glass tube. The wide tube contains one or two long strips of fine sponge that has been cleaned with dilute hydrochloric acid and then dried. The bottle to which this filter is attached must not be larger than the one placed beneath to catch the filtrate. The sponge, of course, must be cleaned every few months.

A NEW TEXTILE.—Naturalists in Russia claim to have made a discovery in reference to the epilobium plant, which may revolutionize the cotton trade of Europe. The epilobium, more popularly known as the "willow herb," from the shape of its leaves, has hitherto been cultivated solely for its flower, which grows from the top of the pod. The Russian savants now claim that this pod can be made to yield a fiber possessing many of the valuable qualities of cotton fiber. In the experiments already made, this fiber has been ginned, spun and woven successfully on a small scale. An economic society in St. Petersburg has now petitioned the Czar to set aside some state lands for the scientific cultivation of epilobium and the continuation of the experiments for improving the fiber. It is claimed by some enthusiasts that the result of this discovery will be in time to avert the necessity for the importation of cotton into Russia.

A WANT SUPPLIED.—The *St. James' Gazette* says: "The need of an instrument whereby the hight of a star can be obtained when the horizon is rendered invisible by mist has been long felt in the navy; but a new apparatus, devised by M. Renouf, promises to supply the want. M. Renouf's device has been tried during a voyage to America on one of the Atlantic mail steamers, and all the observations were obtained with an error less than four minutes.

ELECTRICITY WITHOUT EXPENSE.—An extraordinary invention was recently exhibited by a Mr. Ferguson, in Lombard street, London. He claims to produce light and electricity from chemicals which after being used, are worth $25 per ton more than in their original state. The principal materials used are caustic, soda and zinc.

A NEW SALT.—From the decomposing masses of animal flesh Professor Briggs of Berlin has isolated a very violent poison, which analysis proves to be a hydrochloric salt of a new base, and which does not resemble any other known combination.

TIMBER AND HAIL STORMS.—A number of observations made in Switzerland, Italy, and in other places by Professor L. Glaser shows that the clearing of woods on mountain ridges has been followed by an increase of hail-storms.

MINING AND SCIENTIFIC PRESS.

A. T. DEWEY. W. B. EWER.

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SAN FRANCISCO:
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Passing Events.

The spread of the cholera in Franee and Italy has had the effect of making the officials in all the large eities in this country take steps to purify and cleanse in every direction. As yet no cases have appeared in the United States, and every precaution of quarantine is being attended to strictly, so as to prevent, if possible, the disease gaining a foot-hold among us.

There is very little of special interest to report concerning mining matters. Few new investments are being made at preseut, owing to the prevailing dulness in mines.

There is trouble at the Panama Canal, and talk even of abandoning the whole scheme after all the enormous expenditure. Engineering difficulties uot foreseen have been encountered which will greatly add to the expense. It is said also that there has beeu reckless spending of money, of which the French bondholders are complaining loudly.

THE mines in the Patterson, or Sweetwater District are looking better than at auy time since they were discovered, and a stronger feeling of confidence in the future of that section of Mono county is existing among those most directly interested in the district. One mine, with but a little five stamp mill, has shipped upwards of $200,000 within a year and a half.

THE Ohio Miners' Association is said to be on the verge of dissolution, caused by internal dissensions.

Hydraulic Mining Still Active.

Notwithstauding hydraulic operatious have been stopped by legal proceedings in the more central mining districts of California, they are still being vigorously and sucessfully proseeuted along the rivers in the northwestern part of the State—more especially along the Salmon, Trinity and Klamath. On the latter the business throughout a stretch of more than a hundred miles is being carried on at intervals, accordingly as there are facilities for getting water on the ground, and is said to be in a more prosperous condition this year than ever before. The section of the river where the largest operations are in progress extends from near the mouth of Seott river down to Orleans Bar, having the old mining town of Happy Camp for a center. Here every few miles a hydraulic mine is to be seen in full blast, all running day and night, and some intermitting operations for not more than a month or two in the course of the year—no longer, in fact, than is necessary for cleaning up and making needed repairs.

Although the mines here do not make so large a produetion as did many of those in the central eounties when being worked, they can be outfitted for much less money, while they ean at the same time be run more ehcaply and steadily than the big mines farther south. These Klamath mines are said to yield iuvariably large profits, paying in all cases an annual interest on a fair valuation of 30 per eent, and in some of 45 or 50 per cent. Many of these properties were a few years since offered on the San Francisco and Eastern markets at very low figures. Finding no buyers, the owners have since gone on working them as before, and generally with sueh good results that they do not now care to dispose of them.

There are still, however, some good opportunities for investing money up there, the owners of gravel lands and water rights being, in some instances, willing to convey a large interest in the same to parties who would furnish money for building ditches and outfitting the the mines. Water in that region is very abundant, and generally short ditches suffice for bringing it to points where required for use, the supplying mountains in most places crowd close in upon the river and nowhere lie far baek from it. On the old Rood mine, uow owned by Allen Herald, of Oakland, 3,000 inches of water can be introduced through a ditch uot over one and a half miles in length. To bring that amount of water upon some of the large hydraulic mines on the San Juan Ridge in Nevada county, ditches over 60 miles in length have been required.

In this uorthern region most of the other conditions are equally favorable to hydraulic mining, such as freedom of gravel from pipe clay, hard cement, unwieldly boulders, voleanic cappings, etc., while the question of damage to farming lands, filling up harbors and shoaling navigable rivers cannot here arise, there being none of these exposed to he injured hy the debris from the mines. Though lying so far uorth the mines on the Klamath and Trinity are so little elevated above sea level that they can be run to advantage most of the winter, the ditches being seldom much impeded by snow or ice. This gives to the miner a long working season, the snow on the adjacent mountains, which are quite lofty, keeping the streams that head in them well replenished until late in the summer. Taken altogether the hydraulic mines along the middle Klamath may be considered not only the most eligibly situated, but actually the most prosperous in the State.

MR. FRANK H. FISHER is traveling in the hydraulic mining regions, eollectingr oyalty on "Little Giants," which were manufaetured by R. R. & J. Craig, a late decision of the courts being in his favor. Royalties collected are from $50 to $150 for each grant. The Trinity *Journal* says several thousand dollars have been collected by Mr. Fisher in that eounty, where there are more grants used than in any county in the State.

THE Ione Coal and Iron Company have had a large force of men prospecting for a new body of coal a few miles below Ione for several months past. They have located a deposit, where work will be eommenceed this month towards developing the same. The mine the company are working at present is shipping over a hundred tons daily, and perhaps will hold out for a year longer.

A New Amalgamator.

Patrick McElligot, of Bear Valley, Mariposa county, has just patented through the MINING AND SCIENTIFIC PRESS Pateut Agency an amalgamating device adapted for light and heavy work. On a suitahle foundation frame is mounted at an incline, a pan which may he rotated by proper means. The pan is mounted by means of a central trunnion, hollow, providing for a central diseharge into an underlying sluice. Friction rollers support the pan. Within the pan is an annular groove or channel formed hy a concentric screen. This screen is made in sections so as to be readily removed and renewed. The bottom of the groove is rounded out and provided with a suitable wearing-die.

Heavy metal balls lie loosely in the groove. These are covered with shoes for wear against the die. These spheres or halls, in counection with such parts of the machine as affect the result of pulverizing and discharging the ore, form part of a separate patent application now pending.

Within the sereen are tiers of annular bands, which are copper plates for amalgamating purposes. Each tier is made in sections, the end of one section overlapping the next, and this overlapping is primarily adjusted in such a manner, according to the direction of revolution of the pan, that there may be a fall from one to the other. These amalgamating bands have an inclination towards the center, and this inclination is suffieiently greater than that of the pan itself to make them slope downwardly at all points, even at the lowest, whereby there may be a fall to the center. They may be supported by annular rings set on edge. Around the inner circumference of the outer rim of the pan is secured an amalgamating ring or band, fixed at a point just above the line of the cirele of greatest diameter of the halls, whereby said balls do not touch it.

The operation of the machine is as follows: The ore and water are fed into the groove, and the pan revolved by gearing. The ore passes down to the lowest part of the groove, and there is pulverized by the aetion of the halls, which are set in motion, and continue rolling because of the revolution of the pan and its inclination. The fine pulp passes through the sereen at sueh points where it rises high enough, and the precious particles are amalgamated on the tiers of annular bands. It continually flows to the central discharge over the hands, and because of the revolution of the pan and the seetional overlapping of the amalgamating bands, it has a tendency to flow partially around, dropping off the end of one section on to another. Such of the precious metals as lie on the outer edge of the body of pulp are amalgamated by a circumferential ring of copper plates.

The Utah Mine.

According to the Secretary's report of the Utah Silver Mining Co., of Nevada, the income of $81,625 was mainly made up of four assessments of $20,000 each, during the year. Among the expenses, salaries and wages consumed $38,396; wood and lumber, $13,638; legal expenses, $5,514; water and ice, $8,366, and supplies $6,547. The Superintendent reports that since August 1883, when repairs to drifts and pipes that connect with the Silver Tunnel were completed, almost the whole year had been spent in running drifts in ground that has never been prospected before.

On the 1,350-foot level a good deal of work was done but no values were obtained. On the 1,650-foot level they found vein material of low assays, $3 to $5 per ton, hut the flow of water increased and work was stopped. On the 1,450-foot level the north lateral drift has been extended 112 feet. This drift was started at a point 200 feet east from the ineline station, and has been in vein material for the whole distance. No values by assays were obtained. Indieations of a heavy flow of water were met witb whieh made it unsafe to proceed further; therefore the work was diseontinued. The southeast crosseut, started at a point 200 feet east of the ineline station, is now out from the east drift 282 feet. It has been in vein material from the start, showing stringers of quartz and clay, but no values. The drift is being advaneed at the present time towards the company's south line. The machinery is in good working order, and all the openings are eonsidered in a safe condition for the passage of men and materials.

Speculation and Work.

Just now there seems to be a season of dullness in mining affairs, and in faet, in general business as well. The spirit of speculation, which a few years ago did so mueh harm on this coast, has been rampant in the Eastern States, and in a mueh worse form than was ever the case here. On this coast we had mining stocks only. There they have all the many railroad stocks and bonds, and various other forms of what are called "securities." During the past few months, millionaires, speculators, banks and corporations have lost millions of dollars on paper, and the shrinkage of values has affected thousands of persons. The result has been a lack of confidence and dullness in commerce and trade.

We feel the effects on this coast more or less, though having little direct interest in the "securities," which have lessened in values. Our trade connections, however, are so intimate with the East, that financial stringency there is always felt here.

In California, however, the era of speculation has passed. Mining stock no longer sweeps away the earnings and savings of poor men; railroad stocks and bonds are little thought of; puts and calls tempt us not, and wheat speculation is only done by men of means. We have, as a community, seen the folly of mere speculation, and settled down to business. Our factories are being enlarged; our home industries increasing in number; our lands are being settled up, and farms being cultivated. The people are at work. True, the city life attracts more than it should, and many throng to the metropolis, who would do better in the rural regions.

In another month, the grain crop will begin to move. Nature has returned a bounteous field this season, and the farmers expect large profits. We shall miss, however, our usual millions from the hydraulic mines, which are stopped by injunction of the courts. But the quartz mines are at work everywhere taking out and crushing ore. The depression is only temporary, and not due to local causes. The development of the resources of the State, its increase of population, the establishment of manufactories, and the cessation of mere speculative business, ought to bring California out all right for the year.

Simultaneous Firing of Blasts.

The blastiug arrangements adopted in a long stoue-drift or gallery at a mine in the St. Etienne district, in France are said to be very effective. The length of the gallery when completed, will be 770 yards; at present only about 50 yards have been driven. As it is desired to drive with all possible speed, light machine drills have been chosen for the boring and electric ignition of the shots for the blasting. The cables are carried up to within about six yards of the face of work and are protected by gas-pipes throughout a length of six yards. From the ends of these eables barc iron wire carries the electric current to the fuses, from ten to twelve in number. The firing machine is of the Siemens class, and is very compact and powerful. It is contained in a box of about one cubic foot capacity. Instead of the usual winch handle a draw-bar is used to give rotary motion to the armature. This bar is provided with teeth like a rack, and with a crosshead which the operator seizes with both hands, while holding the machine down with his feet. By such an arrangement great power may he exerted upon the armature. The machine is capable of firing a dozen shots with certainty. Misfires are of very rare occurrence. The simultaneous firing has in this case been found to save fully 20 per eent of the labor of boring.

THE BODIE MINERS' UNION has elected the following officers: President, A. A. Grant; Vice-President, Samuel Lynaek; Recording Secretary, M. O'Connor (re-elected); Financial Secretary, Wat. Morgan (re-elected); Treasurer, C. A. Nelson (re-elected); Conductor, W. H. Netherton; Warden, I. Newman; Finance Committee, Alex. Percy, C. L. Hayes, Hugh O'Harra, H. S. Keenan, John Dolan, Thomas Lenyon, Wm. Doublebee, John Pryor.

THE United States mints coined in June $4,227,885, of which $2,230,200 was in standard dollars, and $1,276,660 in $20 pieces. The coinage for the fiseal year, ending with June, aggregates $57,887,420. There was a decrease of over six millions in the gold coinage.

The "Five" Concentrator.

It is well known that many mines throughout the country are lying idle on account of incomplete methods for saving the precious metals in the ore. It is recognized also that millions of dollars have gone to waste at the mills on account of imperfect concentration. Having these facts in view, Mr. Ernest Koch, C. and M. E., has for some time been experimenting with various forms of concentrators, and has finally invented one which he calls the "Five," because it consists of a combination of five of the best concentrators in use. This he has just patented through the MINING AND SCIENTIFIC PRESS Patent Agency. The five principal elements may be enumerated as follows:

1. The circular table. This is in use at the mills of the Hartz mountain, to save fine sulphurets.

2. The riffle table, which is used all over California for saving gold.

3. The shaking table. The end-side shaking table is the most perfect and closest concentrator known. Still the shaking table works slowly, and the quantity of pulp which can be treated is small in comparison to other concentrators. This is the reason that the shaking of the "Five" concentrator has been placed on the bottom of the concentrator, by which the shaking has been divided on a large surface: consequently the "Five" concentrator, with the shaking on the bottom, will put through more pulp and work superior to the end-shaking table.

4. Side motion. The principle of Frue's concentrator.

5. Jigging table. The most perfect concentrator which has been invented at the mines of the Hartz mountain.

The Five concentrator will be more fully described and explained by reference to the accompanying drawings, in which Fig. 1 is a plan or top view. Fig. 2 is a vertical, central or cross-section. Fig 3. is a detail sectional view of the right angle iron fastened in notches. The circular or polygonal table Fig. 1, consists of eight table sections independent of each other, and arranged around a center.

This table-section (designated by *A* outside the circle) is formed of an iron frame *E*, with V-shaped notches. In each V-shaped notch, angle iron has been ribbed, so that the angle iron forms troughs *G* with slots *I* (Fig 3) in the bottom, the upper edges of the troughs forming the riffles *D* (Fig 1) on the tables. These slots are covered with thin sheet iron, in which small holes have been punched. Each table section is movable, fastened at the shaft *J* by a central ring *I*, and at *S* by iron rods, so that by lifting the shaft *J*, the circular table (Fig. 1) will raise.

Below these movable table sections, is placed a stationary table consisting of iron bars *E*, with chambers *B* below. The iron bars *E* are arranged in such a manner, that each right angle iron of the movable section tables *A* rest upon the upper edges of the iron bars *E*, which are beveled towards the center, and have small flat spaces along the upper edges.

The apparatus operates as follows:

By rotating, the cam *O* will raise the tappet *M*, vertical shaft *J*, and the circular table. As soon as the cam *O* has passed the tappet *M*, the suspended circular table will drop on the iron bars *E* of the stationary table, which produce a general knocking on the bottom of the section tables *A*. Arms or levers *P*, have their fulcrums near the shaft *J*, and their inner ends are connected with the shaft; while their outer ends have adjustable sliding weights *Q* to act as counter-balances and regulate the force of the drop. The iron rods *K*, have turn-buckles *L*, and by shortening one turn-buckle more than the other, one side of each section table will raise higher than the other by lifting the shaft *J*, which will produce a side motion at each section table.

If the holes *D* (Fig. 2) in the chambers *B* be closed with plugs, the water will rise, so that each time the upper table section is dropped, water will be forced up through the holes of the slots into the bottoms of the V-shaped troughs *G*, and produce what is termed a "jigging action." The tappet may be moved up or down on the shaft, to change the height of the lift and drop, and the rods *K* may be lengthened or shortened by means of the turn-buckles *L*, so as to change the grade of the tables. The fly-wheel regulates the rotation of the cam-wheel, and makes it easier on the belt. The pulp or tailings flowing from the battery are led through a trough, and are discharged through pipes *2* into the upper part of each table section. To each pipe a set screw is attached, to regulate the flow of the tailings; thence the tailings flow over the riffles *D*, (Fig. 1) formed by the V-shaped troughs *G*, and passing over the section tables. By means of the blocks on the bottom of the circular table, of the riffles,

Fig. 1.

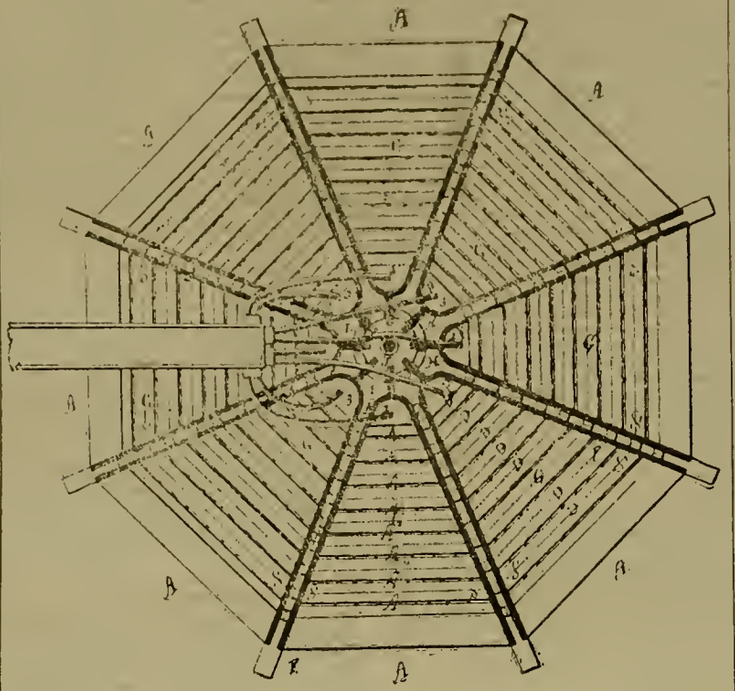

Fig. 2.

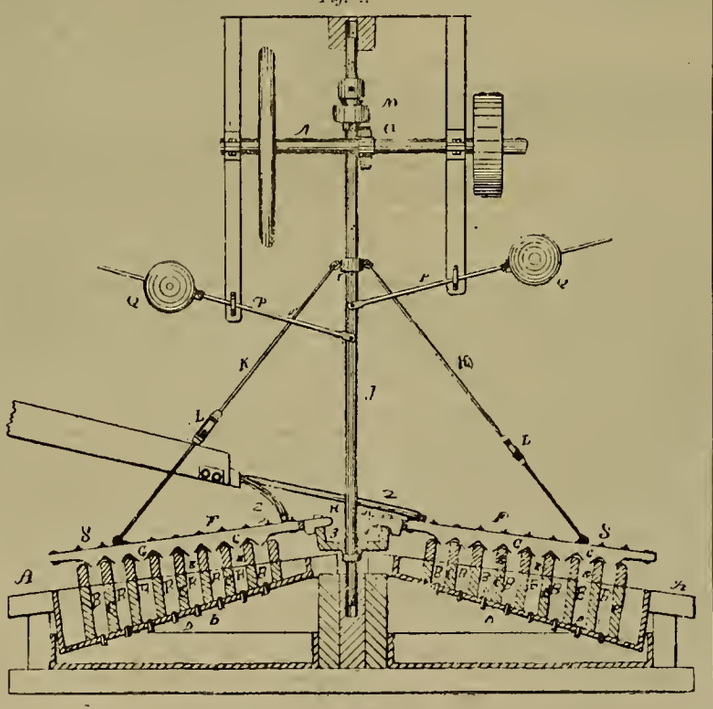

Fig. 3.

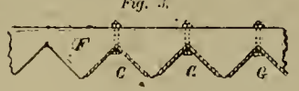

FIG. 1. Plan View of "Five" Concentrator. FIG. 2. Cross Section of Koch's "Five" Concentrator. FIG. 3. Sectional View of Concentrator.

KOCH'S "FIVE" CONCENTRATOR.

of the side motion and of the jigging motion, causes the heavier particles of gold, silver sulphurets and all precious metals gradually to settle to the bottom of the troughs *G*, and finally to pass through the slots into the chambers *B* below, and thence they may be discharged at will through the openings in the bottom.

The following advantages of the concentrator, among others, are claimed by the inventor:

1. The concentrator works closer and saves more precious metals than those of ordinary construction.

2. Different mines have different ore, and it is impossible to work different classes of ore on the same concentrator. This is the reason that the concentrator has been constructed in such a manner that any millman is able to regulate more or less "knocking," more or less grade, more or less holes in the slots, and to change the length of the tables according to the nature and size of the ore; and so soon as the machine is set right there is hardly any show to lose anything.

3. The concentrator is built simple and very durable in its construction, and any millman is able to do all repairing. This is a great advantage over the other concentrators, especially where machine shops are distant. Complicated machines are very troublesome to use.

4. As regards capacity, one concentrator is sufficient for a ten-stamp battery. One big concentrator is easier to handle, and will save room and power over several small ones.

5. There is no need of copper plates, though there is a more complete amalgamation of gold. Close the holes of the slots and fill the first few troughs of each section table with quicksilver to amalgamate the free gold. Hence there is no need of dry amalgam, and the amalgamator can put plenty of quicksilver in the battery, in stead of a few drops, as customary. The quicksilver will be better divided all over the battery; consequently the amalgamation of the gold will be more complete, with less loss of free gold.

6. The concentrator saves the heavy sand in the pulp, which is largely lost by the ordinary concentrators. The heavy sand consists of ore containing precious metals in a very fine state.

7. The machine is very simple in construction; consequently it is cheaply and easily manufactured.

8. The machine will save very fine sulphurets and precious metals. In the battery, until the hard quartz has been crushed to pass through the screens, the soft sulphurets, which are the richest, will be pounded to atoms. Anybody is able to prove the above with the horn by hand. If the tailings are washed in the horn by side-shaking, like Frue's concentrator, only free gold and coarse sulphurets will be saved. Still if the tailings are washed in the horn, and the horn knocked with the finger on the bottom, like the Five concentrator, all the precious metals of the ore will be saved.

9. The concentrator can be adjusted to save on the first part of the section tables fine products or clean sulphurets, and on the last part, raw products or half-clean sulphurets. It is an impossibility to work through a concentrator a large quantity and save all the precious metals of the ore, as fine products or clean sulphurets. Consequently it is a necessity to produce in the first a raw product or half-clean sulphurets, in order to save such a high percentage of precious metals as the Five concentrator yields.

The half-clean sulphurets will be worked again carefully to clean sulphurets on the concentrator, or else amalgamated in the pan.

The concentrator has been recommended years ago in the *Preussische Staats Zeitung*, by the Scientific Expedition sent to the Philadelphia exhibition by the German government; still it has been improved considerably since.

Mr. Koch is also inventor of an apparatus to center transits in mines by screws; and also of lead siphon in use with the system of kettles in desilvering lead by zinc. One of Koch's concentrators is set up at the Hendy Machine Works, 49 Fremont street, San Francisco, where it can be seen. Those interested in concentration can take small lots of ore there and work them themselves on the machine, so as to test its capacity and utility.

Technical Society of the Pacific Coast.

At the regular monthly meeting of the Technical Society of the Pacific coast, held last week at their hall, 413 Sutter street, three papers were read. The first was "On Retorting Silver Amalgam in Vacuo," by Fr. Gutzkow; one by Ross E. Browne, of University of California, entitled, "A Criticism of Becker's Theory of Faulting in Mineral Veins;" and one "On the Treatment of Torrential Sediment-bearing Streams in Europe, and its Application to California," by Geo. J. Specht, C. E.

Mr. Gutzkow described in detail, with model and drawings, an apparatus for retorting in vacuo. The appliance has been tested satisfactorily. It is an adaptation of another plant by the author introduced in 1868 in connection with his sulphate of iron refining process at the gold refinery formerly owned by the San Francisco Assaying and Refining Works. A number of these have been in use 12 years or longer. There is no patent on the plant, so anybody may use it. We shall give this paper after it has been published in the Society's proceedings.

The paper by Ross Browne was specially interesting to mining engineers, and is mathematical in its nature. Mr. Becker, of the United States Geological Survey, in a Government publication advanced some theories on "faulting" on the Comstock lode, which Mr. Browne takes exception to.

The paper of Mr. Specht is referred to more fully in another column of the PRESS.

A LARGE quantity of machinery for the cotton mills in Oakland is being discharged from the ship *Servia* at Vallejo-street wharf.

Nogales.

A Growing Mining Center.

Mr. Samuel Brannan, well known in this city, wrote to the *Alta* from Nogales as follows:

Nogales is situated half in Arizona and half in Sonora, on the line of the Sonora Railroad from Guaymas to the Southern Pacific. This road runs through a valley 500 miles long and thinly populated, and the time is twenty-two hours from Guaymas and ten hours from Tucson by stage. It is seventy five miles to New Virginia or the New Bonanza mines. Two opposition stage lines are running from Tucson to Nogales, $7 fare, just half the railroad charges, taking all the eastern and western travel. The town is one year old. The nights are cool enough for two or three blankets in the summer months. The altitude is 4,500 feet above the sea. In the daytime the thermometer stands from 60 to 90 degrees, and at night from 50 to 60 degrees during the Summer months. Vegetables can be raised twice a year. Fruits are very productive. All grains grow fine, and some crops produce twice a year. The same may be said of the whole valley. It is more of a Paradise hid than a Paradise lost.

Water is very abundant in this section of the country, and particularly in this place. It is easily obtained by digging from twelve to twenty-four feet. It is the best of water, pure and cold the year around. It is a fine location for manufacturing purposes, there being wood, water and coal in abundance; and being located on the line of the United States and Mexico, the place has both countries for a market. An iron foundry and a machine shop, manufacturing for mines in particular, would do well here. Iron and coal are found plentifully not far away. A flour mill would do well, there being a good market at home.

Windmills can be used during the dry season, when the trade winds prevail; and the wells are never known to fail.

Nogales is surrounded with the richest mines in the world—gold, silver, copper, lead, coal and iron—and is the outfitting station for the celebrated Sierra Madre Mountain mines, now no longer occupied by the Apache Indians, but free to all. These mountains are now open to the prospector, and there are no Indians to molest or interfere. The Apaches occupied these mountains since 1820, up to within two years past, and no one was able to visit them. Gen. Crook now has these Indians all corralled at San Carlos, on the reservation in Arizona. In 1820 was the time when they massacred all the Spanish miners and priests then located there, and four years before the Republic of Mexico was established. The old ruins of villages, churches, ditches, mines and arastras are still visable, the mines in particular. There are some twenty-five in the group, and there is also a mountain of horn silver, two and a half miles at the base, which at that day people did not understand how to work. Gen. Crook has left the way open and clear, and from this time further we may look for no more Indian rades to disturb the miner. They are too far north, should they jump the reservation, to do any harm. It is supposed at the time of the massacre that there was a great deal of gold and silver buried in the ground which will be discovered by the prospector. So far, these mountains have been a sealed book.

Two hundred mules with wagons loaded with silver ore arrived at this point lately, the ores to be shipped to Guaymas and from there reshipped East. Twenty-seven thousand dollars of silver bullion also arrived.

Cœur d'Alene Mines.

In speaking of the future of the mines, the *Eagle* says: The season in the Cœur d'Alene mines has thus far outstripped all the expectations that have been formed of the camp. It is not only demonstrated that gold is here, but that it is here in paying quantities. Gold in paying quantities has been found at every point on the main creeks where bedrock has been uncovered. Much of the work done on claims thus far has been mere prospecting work; on others the work is of a permanent character needed in the opening and development of the mines. An immense amount of dead work has already been performed along the length of Pritchard creek which will not have to be done over again. In order to open claims it is necessary to spend money with a lavish hand, and this has been done right along. The time is near when those claims will begin to realize on the investment. They will be in shape to produce, and once the work of production begins in a few claims the entire camp will feel the effect. The season has been one of many and peculiar discouragements to miners, but all along the creek we find a more cheerful view of things beginning to prevail. The camp is a certainty. The future of the mines are assured. After this summer it will settle down on the staple basis of its own merits. The placer fields will begin to reveal their true wealth, while the development of the quartz lodes, in which capital is already interested, will be quietly proceeded with. The irresponsible chatter of journalistic magpies in the played out camps of the west can do us no further injury, and the time is coming when the stern logic of facts and events will compel them to swallow every word they have uttered in villification of Cœur d'Alene.

For in spite of all the pains nature has taken to conceal her mineral wealth, the one plain fact is made apparent by the work already done that Cœur d'Alene is a great and glorious camp; that the boundless possibilities of its mineral wealth are but just beginning to dawn upon the minds of those who knew it best and longest. In spite of all that may be said to the contrary, Cœur d'Alene is the great treasure vault of the American continent.

Merchants vs. Miners.

A prospector writes to the *Colorado Miner* as follows: I note with pleasure your remarks concerning the co-operative system of mining in Gilpin county between the merchants and miners. This county has an abundance of first-class properties that belong to poor men who need but a little assistance to "strike it rich." To-day there is warfare going on in the county between the miner and the merchant, the former conjuring up some excuse whereby he can obtain ammunition and "grub," while on the other hand, the latter is devising means to collect his bills and prevent further credits. Now of course this produces hard times in our mercantile circles, and straugers and commercial travelers, hearing our merchants complain, take for granted that the mines have stopped yielding and that the county has gone to the devil, and where speaking of the county abroad, do not hesitate to represent things in that light, all of which is damaging to our prosperity, being badly advertised. Even our prosperous miners are also imbued with the idea of dull times, and instead of spending their money in town, send it East, or else deposit it in bank. They say to themselves. "this old suit of clothes will have to do me for a while longer, and I must cut down on my grub bill, for the town people say times are hard, and they ought to know."

This state of affairs would soon cease if the Gilpin county plan was put into execution, for the merchant would become a miner, and the miner, as his partner, would work harder and more cheerfully, feeling that he had the interest of others at stake and no bills coming due. The merchant, as a miner, would have no time to complain of hard times, and the miner would be constantly at work, and the county would not have to depend upon the output of companies or lessees, but everybody would be directly interested in mining, and therefore become producers.

Denver's Ore Market.

Looking at Denver as an ore market, there is, perhaps, more encouragement for the future of this city in our rapid growth as an ore market than in any other fact of the present situation. The amount of ore brought here for sale has been steadily increasing during the last few years without exciting a great deal of attention. What is better, and what is full of hopeful significance, is that the area of mining country from which this ore comes has been constantly enlarging. It is drawn in greater or less quantities not merely from all parts of Colorado, but from Montana, Idaho, Arizona, New Mexico and old Mexico. In short, it comes from the entire region which we ought to be now occupying with our commercial agents, and to which we should be distributing our goods. For these ores we ought to exchange the necessities of life, instead of paying for them in cash.

The quantity of ore daily brought into Denver by the railroads cannot be accurately given, but it is estimated to average all the way from 700 to 1,000 tons. This is the equivalent to from 70 to 100 carloads per day, and is of itself enough to constitute a considerable business. Those conversant with the subject, predict that a few years hence the city will receive an average of 5,000 tons a day. Not only will the mining localities now shipping to us increase their output, but many mining camps which we do not get will come to us. Rail rates will become more favorable, and country smelters, with their inadequate plants, will gradually die out. A further resource is the almost certain discovery of new deposits within the territory now patronizing us.

Half a dozen years ago, various kinds of works for the treatment of ores were scattered all over the State. Most of them were inconsiderate experiments, and the best and most successful labored under the disadvantage of being particularly confined to the ore produced in its immediate vicinity. Now it is an established fact that a great smelter can only succeed where the ores of a variety of widely separated mines can be had, so that they can be mixed to produce the most profitable results. This advantage overcomes any possible saving in transportation, and naturally locates the smelter at the center of a railroad system radiating into the mountains. Another fact which appears to be in process of demonstration here is that small smelters, even at an ore market like this, cannot compete with large ones. It is contended that instead of having a number of new but small smelters we will have, from time to time, enlargements of the large ones, such as is now taking place at the Grant smelter. Smelting men admit that there is a field in Denver now for a big smelter with $1,000,000 capital, whereas ten smelters with $100,000 capital each might all fail from inability to compete with Grant and Argo.—*Denver Tribune.*

The Origin of Coal.

Is It Derived from Petroleum?

The discovery of vegetation in bituminous coal caused Lyell and other geologists to assume that coal was vegetable matter condensed and carbonized by chemical action under pressure, while protected from atmospheric action by a covering of water caused by the subsidence of the earth's surface during the carboniferous era. We owe so much to the pioneers in scientific discoveries, and have so much admiration for the zeal and patience which examines and elucidates facts to increase our knowledge, that we feel grateful for the gifts received; but there is one characteristic of the followers of great men which is not praiseworthy. It reminds us of what we sometimes see in the crossing of streams—animals fastened together, the tail of the first tied to the head of the next, and so on to the end of the procession, in which no follower leaves the trail of its leader, and the correctness of all depends on the exactness of the one who leads. We appreciate the virtue of fidelity, and yet reverence truth. This explains why we leave the trail.

A Similarity of Elements.

Humboldt, in his "Cosmos," remarks: "It must, however, be remembered that the inorganic crust of the earth contains within it the same elements that enter into the animal and vegetable organs." The chemists have demonstrated that all matter can be reduced to a few elements, and these combined in different proportions form every object we know, including the planet on which we live, as also the air we breathe. That a similarity of elements combine in wood and coal is not surprising; but we do question the absolute identity. The difference in ash of vegetation and coal proves this conclusively, and a careful analysis of known liquid products obtained from vegetation in approximate quantity as compared with petroleum, will prove petroleum to be inorganic matter, and not a vegetable product.

Various Observations.

Dana describes petroleum as composed of carbon and hydrogen, and adds, "When the oil is afterwards exposed to the air it often oxidizes and becames thick, and finally solid, passing ultimately to asphaltum or some analagous compound." Humboldt, in his observations of nature as a whole, suggests to us even more than his wonderful industry demonstrated. Thus in Cosmos: "I would instance the Saarbucker coal measures where 120 beds are superposed one on another, exclusive of many which are less than a foot in thickness." He also states that "the coal beds at Johnstone, in Scotland, and those in the Crenzot, in Burgundy, are some of them respectively 30 and 50 feet in thickness, while in the forests of our temperate zones the carbon contained in the trees growing over a certain area would hardly suffice in a hundred years to cover it with more than a stratum of seven French lines in thickness." Humboldt, in his "Aspect of Nature," refers again to this estimate (seven-twelfths of an inch), as Chevandier's calculation. The perfect preservation of fragile plants and insects found in coal, and minutely described by Lyell, Richardson, Mautell, Dana and others, is analagous to the known preservation of plants and insects in amber and gum copal. We quote: "The preservation of sharp angles of numerous stems of plants known to be of a soft, juicy nature, with the surface of the sigillariæ, especially marked with lines, streaks and flutings so delicate that the mere drifting of a day would have inevitably destroyed them." The impression forced on the mind in this case is nearly a conviction that these objects found in coal were suddenly excluded from air, and decay arrested, under conditions identical with similar substances preserved in gum copal. In "Orr's Circle of the Sciences," Vol. VII, p. 462, it is stated that "100 parts of Bathgate coal will yield about 40 of oil which is fit for machinery, and 10 of parafine. Brown has obtained same products from bituminous coal and bituminous schists by similar process of distillation." The presence of sulphur in larger proportions in bituminous coal than is found in vegetation also suggests the incorporation with petroleum while in a fluid state. The "horses," so called by miners, closely resemble islands surrounded by coal. Le Conte ("Elements of Geology," p. 173) states that coal strata thin out at the edges. The trunks of trees projecting through veins of coal, and often petrified where not incorporated with the coal, compels a dissent from the theory that the tree first caused the petroleum.

Conclusions.

The unwillingness to consider petroleum as *primordial, with sulphur and salt, can be best illustrated by Humboldt's remark: "The pertinacity characteristic of error."

Education suffers in proportion as people are compelled to unlearn what, as children, they acquired by hard study.

Students of Nature are not always book-makers, but a book-maker who will not observe Nature, may perpetuate error, when his duty as teacher should urge him to seek the truth.

The proof that coal is fossil bitumen is perhaps too plain and simple to please those who have adopted the elaboration of coal and petroleum from wood or peat, supported by arguments of intricate ingenuity. But an investigation will determine the truth, and we cheerfully strive to aid this resolution.—*E. E. C. in Denver Republican.*

*We do not mean that the elements of petroleum are not classed as primordial, but object to the conclusion that vegetation must first combine them to produce petroleum or coal.

†LeConte's "Elements of Geology," p. 367, gives less than two-thirds of an inch of coal as the equivalent for a vigorous growth of vegetation of one hundred years.

Simultaneous Blasting in Mines Without Electricity.

The advantages of simultaneous ignition of a number of holes under a great variety of conditions is almost unanimously admitted among practical men. The problem has long been how most safely and economically to effect it. It was soon discovered that the steady and useful old safety-fuse could not be depended on for this particular class of work. Resort was then naturally had to electricity, and it is not denied that in expert hands and under favorable conditions admirable results have often been obtained by Abel's and Brain's electric fuses fired by dynamo and other exploders.

The difficulty has hitherto been, and will probably still be, to get the scientific apparatus carefully and accurately handled by the ordinary miner under the awkward circumstances of the wet, dirt and darkness of underground. The practical result has often been found to be that after the considerable outlay required on exploders, cables and electric fuses, the complete circuit of charges is not exploded, and thus, though theoretically most perfect and safe, there still remains the element of uncertainty and its accompanying danger. To meet this difficulty, Messrs. Bickford, Smith & Co., Tuckingmill, Cornwall, have introduced their patent igniters and instantaneous fuses, which are fast getting into favor in lieu of the more expensive electrical blasting in the majority of operations where simultaneous ignition is desired. This new method is so simple that a simultaneous blast of any number of holes can be arranged and effected by the ordinary miner without the technical knowledge of the appliances and careful handling necessary for producing the electric spark.

The advantages claimed for these igniters will be at once apparent to the practical operative, from the fact that each igniter is complete in itself, and is issued by the makers ready for use, with the necessary instantaneous fuses attached for any given number of holes to be instantaneously blasted, whether in dry or damp soil, or subaqueous work. The well-known Bickford safety fuse being inserted for conveying the fire to the explosive disc at the point of junction, is lighted in the usual way, and the unfailing result is a simultaneous blast of all the charges. It will be seen that no machines or cables or wires require to be manipulated, but the simplicity and comparative economy of the self-contained igniter are gradually introducing simultaneous blasting where other means had been unsatisfactorily tried.

The invention has been subjected to several tests and experiments under various conditions, with the greatest satisfaction and success, and those most competent to judge have pronounced it to be a simple, sure and cheap means of "volley" blasting. Many instances of successful trials with these goods might be cited, but perhaps as valuable as any in favor of these appliances is that of Mr. MacRoberts, chief chemist to the Nobel's Explosives Company, who says, in a report he made in 1880, that he had tested the instantaneous fuses with very excellent results. "Both to the eye and ear the explosions were perfectly simultaneous." In Mr. Robert's opinion, blasting with fuses of this description is superior to electric blasting, and, he adds: "One of the set tried contained no fewer than twenty-three instantaneous fuses, each nine feet long, tied into one igniter. I had them filled with twenty-five double detonators. All went off, and the explosions sounded as one; so that, had these fuses been used in blasting twenty-five holes, there would have been an instantaneous blast of the twenty-five. All others tested exploded simultaneously, so that there can be no doubt that Messrs. Bickford, Smith & Co. have completely attained the object aimed at in these fuses." Better evidence could hardly be desired, but if more is needed it can be found in the fact that the value of these inventions have invariably been recognized whenever the fuses have been shown at the great scientific and other exhibitions at home and abroad. Wherever exhibited first-class prize medals have been awarded them.—*London Mining Journal.*

Technical Education.

At the annual meeting of the governors of the City and Guilds of London Institute for the Advancement of Technical Education, on March 19th, the Lord Chancellor, who presided, in moving the adoption of the report, said that the buildings of the central institution were now nearly completed, and it was expected that they would be publicly opened in June. The arrangements in connection with the work to be carried on there had now, to some extent, been made. It was proposed that four principal professors should be appointed in connection with the central institution—viz: professors of chemistry, of engineering, of mechanics and

mathematics, and of physics, as well as a proper staff of administrators and assistants, the whole to be superintended by a board of studies. Laboratories, properly fitted up, workshops, and drawing offices would be made use of with the view of giving instruction which should combine the elements of those fundamental studies which underlay the technical arts with practical work itself, and it was hoped they might in this respect be able in some degree to improve upon those models with which the experience of the Continent had furnished them. An entrance examination would be imposed on the students to make it certain that they had had sufficient elementary preparation in science, mathematics, modern languages, and drawing, and those who did not obtain exhibitions would pay the moderate fee of £30 per annum. It was hoped that as time went on the number of exhibitions and scholarships which would enable poor but clever and meritorious students to obtain the benefits of the institution would increase. A generous beginning had already been made by the Clothworkers' Company, who had granted three exhibitions of £60 pounds each, tenable for two years, but capable of prolongation to three years. It was assumed that £9,000 might be found sufficient for the purpose of maintaining the institution, and the council hoped they would not be too sanguine in expecting £2,000 per annum in fees from the students, which would give them £11,000 altogether, allowing for the gradual process which must take place until the students obtained their maximum number. When there were as many as 150 or 200 students the fees might be reckoned at about £5,000, and this would supply half of the £9,000 which was mentioned as the probable expense of maintaining the institute in full working order. As to the Finsbury College and the South London School of Technical Art, both showed an advancement in regard to the number of students and to the amount of work done upon what was accomplished in the previous year, although in both, if the means were forthcoming, it would be desirable to extend the work. Nothing could be more striking and satisfactory than the progress of the work of the institute in connection with its technological examinations, by which it diffused its influence over the whole community in the United Kingdom. The candidates presented for examination last year were 2,397, being an increase of 425 over the former year, while those who had passed numbered 1,498, showing an increase of 276, and the number of centres had increased from 147 to 154. What was still more remarkable was the rapid extension of the desire to have these technological examinations, for they were now preparing for them 5,862 students, being an increase 1,814 upon the numbers of the previous year. Owing, he believed, to the influence of the institution, classes had recently been established in 102 different parts of the United Kingdom. With regard to finance, it was satisfactory to find the institute had strictly adhered to the lines they had laid down, and the council claimed that their estimate had in substance been fulfilled. If they wanted more means, it was not through any excess or folly of theirs, nor through any unforseen cause, but through causes which had from the beginning been presented to the minds of those interested in the work. There was an expectation that the cost of the building of the central institution would be greater than £75,000, which was the estimated sum. At the same time, an additional £20,000, not included in the estimate, would be required for the fitting up of the building. There was a deficit of £1,240 in the building fund, so that altogether the amount required for completing the buildings would be about £21,000. He recognized with great gratitude the liberality with which hitherto the institute had been supported by the city and by most of the guilds of London, but he could not help thinking that, having done this good work, and having every reason to be satisfied with its results, they would be ready to help it still further. He might say that the Skinner's Company had, since the printing of the report, increased their subscription from £500 to £1,000, and their donation to the building fund from £2,000 to £3,000, while Mr. Hooper, a manufacturer, of Westminster, had promised to give £100 towards the first £1,000 required, provided that the remainder were provided by nine other manufacturers. These facts ought to be taken as examples by the great city of London and by the city guilds, who had been such a great support to the work hitherto, and who, he hoped, would continue till all of those present at the meeting were in their graves, to be associated with it.

THE SILVERADO.—The Silverado Company is pushing things in Sweetwater. There are now fifteen men working in the mine and a number of men who are also employed making a trail from the mine to the mill. Mr. Downing is hurrying everything as much as possible, especially in the mine in order to get out ore enough to meet the demands of the mill. Rapid work is being done on the mill, extra mechanics having recently been employed and it is expected that it will be finished by July 1st.

THE hoisting works on the New London mine at Mojave, are finished and steam was up last Thursday for the first time. Everything worked like a charm under the supervision of that boss machinists L. J. Lassell. This mine has been employing thirteen men, but the force will now be doubled and the mine worked night and day.

USEFUL INFORMATION.

Italian Methods with Lime Mortar.

A correspondent of the *Builder* gives a few details of the Italian method of making and using lime mortar which are new to us, and of considerable interest, as are nearly all the particulars of construction as practiced by these skilled workmen. In the opinion of the *Builder's* correspondent, most of the modern Italian processes are identical with those practiced in the same country by the ancestors of the present inhabitants 2,000 years ago; and he believes that the good quality of the Roman mortar, which has been proverbial for centuries, belongs equally to that made every day in Naples or Perugia.

As every one knows, the custom among the Italian masons is, on commencing work upon a new building, to dig first a pit large enough to contain all the mortar required for the work, into which is put lime enough to fill it, within a foot or two of the top. Water is then poured in until the pit is filled, and the mixture is left to itself, care being taken only to add water as that first put in is evaporated or absorbed. As mortar is wanted, a portion of the lime is taken from the mass, but the lower portion, which will be used to mix with the plastering mortar, remains undisturbed for years and acquires a smooth, pasty quality much prized by the Italian architects, who place a value upon the lime which they use for such purposes proportionate to the length of time which has elapsed since it was first slacked. The good effect of this mode of preparation is seen in the perfect stability of the mortar, which never swells or cracks, and when used in brick-work or stone masonry, is never observed to give rise to those disfiguring efflorescences which are almost inevitable with us. On plastering mortar thus made there is no difficulty in laying the fresco colors which are used in Italy with such splendid effect, but which burn out into pale and unsightly patches when laid upon our raw, half-slacked mortar.

With lime treated in this way work can be executed which would be impossible with such materials as we employ. As an instance of this the correspondent of the *Builder* quotes the *battuto* roofing, which is constantly used to cover costly and important buildings in southern Italy, and which consists simply in a thick coating of lime mortar spread over the timber-work and beaten continually with heavy clubs for ten days or two weeks, in order to consolidate it. The climate of southern Italy is rainy, if not cold; but these roofs, which, if made of what we consider good lime-mortar, would transmit water like a sponge, serve there to protect for centuries the house beneath. The same kind of work is used for floors, taking the place which would be filled among us by cement-concrete, and the beaten lime floors appear to be as hard and smooth as anything that we construct with much more costly materials. That this difference in quality between our own and the Italian mortars is due to the mode of treatment rather than the original character of the lime used, is indicated by the fact that many different varieties of limestone are employed there, according to circumstances of localities or convenience, without any material variation in the result, the Italian workmen having learned that art which we care so little for—the making the best of poor or indifferent materials.—*American Architect.*

TO DETECT TAINTED CANNED GOODS.—Dr. J. G. Johnson, of Brooklyn, has given the following rules as aids in detecting unsound or tainted canned goods: "Every cap should be examined, and if two holes are found to have been punched in it take the can immediately to the Board of Health with its contents and give the name of the grocer from whom it was bought. Reject every can that does not show the golden line of resin around the edge of the solder of the cap, the same as is seen on the seam of the side of the can." The absence of this indicates that the sealing was effected by the use of muriati acid, the doctor claims. "Reject any and every can that shows any rust around the cap on the inside of the head of the can. Reject any that does not bear the manufacturer's name. Before buying press the bottom of the can up, and if the contents are decomposed, the tin will rattle like the bottom of the oiler of your sewing machine. If the contents are sound, the bottom will be solid and impossible to push up."

GLASS BEARINGS.—Bearings made of glass are now being experimented with in the rolling stock of railroads in regard to their frictionless quality. This material is a hard, clear substance, and must wear down smooth and give a fine bearing surface for an axle to rest upon. It is a non-conductor of electricity, if not of heat, and the fine particles have as good a chance to work down the bearing of the axle to a running fit as in the grinding in of a valve seat for a brass valve, and much power is expected to be saved by converting the wearing of a journal into some other agency than by converting it into heat.

BAY WINDOWS FOR CARS.—Five bay windows on each side will be a feature of the new parlor cars now being built for the Pennsylvania road. They do not project beyond the sills, but the space between them is set in towards the center of the car, enough to give the bay effect, without noticeably intruding upon the space. The width of each bay window is seven feet, two inches, consisting of a central window three feet wide, and two wings, deflecting slightly in opposite directions, which are each two feet, two inches wide.

HOW TO AVOID SMOKE FROM FURNACES. The following simple method for the consumption of smoke is given by a German exchange: Start the fire as usual and let it burn until the coals are in a bright glow; then rake the coals on the grate to the right and left, so as to form an empty space along the middle, and put the fresh coals into this space. The smoke which is formed from the fresh coals is consumed by the glowing fires on either side. If the grate is very wide, two such open spaces in the fire are advantageous for the addition of fresh coal.

COPPER ROOFING. A contemporary says that no limit can be placed to the life of a building roof made of copper sheathing, which costs at this time not more than double the price of tin, that has to be painted every year and wears out in a few years. No material is known that is as cheap and durable as copper sheathing for roofs of houses. There are several old buildings in this country that were covered with copper eighty and ninety years ago, and the roofs to day are as sound as when first put on.

TRAP DOORS IN THE ROOFS OF CARS.—It has been recommended in the report of a special railroad committee, that trap doors be placed in the roofs of passenger cars, and that hereafter all passenger cars be so constructed as to have an opening in the roof, the cover of which can be removed in case of accident, as may be required. The report was accepted and the committee was continued, with a request to furnish plans for the proposed change at the next meeting.

TO DETECT INFERNAL MACHINES.—M. de Fonvielle has suggested the following method of detecting infernal machines: All luggage to be placed on wooden tables, supported by iron feet, but not nailed to them. A microphone to be placed on each of the tables, when any ticking or other noise proceeding from the luggage would at once become audible.

METALLIC PAPER is a French invention, and upon it chromo-lithographs are rendered transparent by a coating, and backed with tin foil. The effect is said to be very striking, and the possible applications of the invention are very numerous and useful.

BRONZING.—It is asserted that articles of iron or brass may be brouzed by dipping them into melted sulphur, mixed with lamp-black. The surface, after being drained off, will take a beautiful polish, and presents the appearance of oxidized bronze.

GOOD HEALTH.

The Teeth of the Future.

In an able address recently delivered, Mr. Spence Bate, F.R.S., has drawn attention to some remarkable features, which it may be interesting and instructive to take into account. In the teeth of the Esquimaux, the Red Indians, and the natives of Ashantee, as well as those found in the ancient barrows of England, the so-called interglobular spaces, seen so frequently in sections of modern teeth, appear not to exist; nor, indeed, are they to be detected in the dentine of the best developed structures of the modern European. Not only is the dentine getting deteriorated, but the enamel would seem likewise to be undergoing a modification—becoming too opaque. In addition to the histological changes, the external form and character of the teeth are sustaining an alteration. This seems to be in relation to an important feature in the history of their evolution.

The tendency for the cranium to develop at the expense of the face and the jaws is seen to occur as we ascend the scale of the vertebrated series of animals. Owing to this atrophy of the jaws, the proper space for the full play and development of the normal teeth would seem not to be available. At birth, the bones are not sufficiently grown to receive the teeth in their normal arch; and, as in the human mouth, the premaxillary bones are firmly united a short time after birth, it follows that the posterior part of the jaw is the only place where growth can occur. Any delay in the development and consolidation of the symphysis must have the effect of contracting the space required for the teeth at this site. In the course of vertebrate evolution there is a marked tendency for teeth to disappear. The lower vertebrates have four molars on each side in each jaw, the higher have three, while in man the number is reduced to two.—*The Lancet.*

[The inference is, that teeth are being gradually evolved into brain matter, and as man increases in intellect, his masticators become unnecessary. The future man will have a large brain, but no natural teeth. He will have to depend on the mechanical dentist.—EDS. PRESS.]

TURPENTINE IN INFECTIOUS DISEASES.—The *Medical Record* tells us that H. Vilandt writes in the *Ugeskrift for Ledger*, concerning the value of the oil of turpentine in the treatment and prophylaxis of diphtheria and the exanthematous diseases. He states that he has never seen any of these diseases spread from a sick child to other members of the family when this remedy was employed. In many of his cases no isolation could be attempted, as the mother was the only female in the family, and was obliged to take care of both the sick and the well, continually passing back and forth from one to the other. His method was to pour from twenty to forty drops of a mixture of equal parts of turpentine and carbolic acid into a kettle of water, which was kept simmering over a slow fire, so that the air of the sick room was constantly impregnated with the odor of these two substances. He claims also that by this means a favorable influence is exerted upon the exudation in diphtheria, although it is by no means curative of the disease, and should never be relied upon to the exclusion of other remedies.

TOBACCO AND THE PULSE.—Dr. Troitski, says the *Journal de Medecine de Bruxelles*, has made a number of observations upon the effects produced on the temperature and pulse by smoking. He found that in every case, varying according to the condition of the individual, there was an acceleration of the pulse rate and a slight elevation of temperature. If the average temperature of non-smokers were represented by one thousand, that of moderate smokers would be one thousand and eight, and while the heart in the former case was making one thousand pulsations, in the latter it would beat one thousand one hundred and eighty times. It is in the latter effect that he thinks the danger of tobacco-smoking is manifested.

PREPARING TO BE DUMPY. Women, especially those of the upper classes, who are not obliged to keep themselves in condition by work, lose after middle age (sometimes earlier) a considerable amount of their hight, not by stooping, as men do, but by actual collapse, sinking down, mainly to be attributed to the perishing of the muscles which support the frame, in consequence of habitual and constant pressing of stays and dependence upon the artificial support by them afforded. Every girl who wears stays that press upon these muscles and restricts the free development of the fibers that support them, relieving them from their natural duties of supporting the spine—indeed, incapacitating them from so doing may feel sure that she is preparing herself to be a dumpy woman.

BURYING ALIVE.—A paper recently read before the French Academy of Medicine expressed the writer's conviction that one in every 5,000 persons is buried alive. This estimate, however exaggerated, is not calculated to allay an apprehension which is conspicuous among the French people, and which was lately brought to public attention by the declaration of the President of the Chamber of Notaries that express instructions are given in one will out of every ten to have the heart pierced by a qualified surgeon before the lid of the coffin is screwed down.

REMEDY FOR WARTS. Those who have not faith sufficient to utilize any of the numerous magical methods of curing these annoying blemishes, may try the following: Iodine (crystals), one-half dr.; acid, carbolic (crystals), two dr.; alcohol, twenty-four drops. Scrape the wart as much as possible without causing it to bleed, then apply the remedy carefully by means of a pointed stick. Scrape again, and so repeat as long as possible. Nearly the entire excrescence may be gotten rid of at a single sitting in most cases.—*Good Health.*

HOT MILK.—The hot water cure has its value, and many have been benefited by it. The hot milk cure is of more recent origin, and for exhausted conditions to be preferred. The temperature should be as high as can be sipped in small doses with a teaspoon. Its good effect comes quite quickly; indeed, more quickly and more permanently than the effects of alcohol, to which it is greatly superior. Women should use it in preference to hot tea, for its heat is quite as beneficial, and it has no injurious effects if used properly.

A HINT FOR THE SICK-ROOM.—Impregnation of the atmosphere of a sick-chamber when the patient is ill of diphtheria, measles, scarlet fever, or of any allied disease, with the odor of a mixture of equal parts of turpentine and carbolic acid is recommended by Dr. Vilaudt. Half a teaspoonful of the mixture will be enough at a time, if it is put into a kettle of water kept near the boiling point. The odor generally gives some relief to the sufferer, and tends to prevent the spread of the malady.

ONE-SIDED CHILDREN.—The bodies and heads of children are sometimes distorted because the mother or nurse carries them to much on one arm. This is almost sure to be the case if the mother can nurse them only from one breast, as now and then happens. Mothers may correct this by changing the child's position frequently, and this her love for her child will prompt her to do if she knows how important it is.

VASELINE IN SCARLET FEVER.—Dr. J. B. Johnson, of Washington, recommends the use of vaseline as a local application once or twice a day to remove the itching and burning sensation caused by the eruption in scarlet fever,

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA

Amador.

SOUTH SPRING HILL.—Amador *Ledger*, July 12: The first clean-up since the mill resumed work was made last week, and realized a trifle over $6,000 for the month's run with ten stamps—a result fully as satisfactory as previous runs. The mine looks as well as ever. A road is being made to enable teams to travel between mine and mill more readily.

Calaveras.

WEST POINT.—Calaveras *Chronicle*, July 12: Our mining interests are steadily improving. Quite a number of quartz speculators and mine owners are visiting in this place. It is rumored that they are here for the purpose of purchasing mines, if they can get them at a reasonable rate. If it is possible for them to get a few of our good quartz mines started it would greatly improve the business of this place.

JOTS.—The south level of the Scorpion mine is still being driven ahead to connect with the south chimney of rich rock which lies 150 feet south of the present working shaft. The Lockwood mine will soon be in operation again under the management of Messrs. Russel & Shivers, who are at present prospecting it. This mine has spoken for itself in the past and will do so again in the future. G. Eberhardt & Co. have been making a chamber in the tunnel of the Blazing Star mine, preparatory to sinking a good working shaft on the lode. The Bismarck mine is being worked by Otto Mentzel & Co. Thelledge is over two feet wide; 20 tons of ore, lately crushed paid $40 per ton. Messrs. Rowe & Jenkins have a full force of men at work on the Henry mine, and are taking out good rock; about 60 tons now on the dumps. Work has been resumed on the Mitchell mine by Mr. Haskins, who has struck some good pay rock south of the old working shaft. He contemplates soon to put up machinery to handle the water, which has been the trouble in the past. Messrs. Johnson & Smith have struck a good vein, about two miles from town, which prospects well. Mr. Clark is working his mine at Sandy Gulch with Chinamen. Messrs. Shives & Russell have a force of men digging a ditch to carry water from the Middle Fork to their reduction works on Bear creek. The Wide West mine still continues to turn out good quartz; depth of shaft 85 feet; width of vein 2½ feet; 40 tons of quartz on dumps.

THE BLAZING STAR MINE.—The Blazing Star mine is about 1¼ miles east of the town of West Point, and is bounded on the north by the Old French lode, on the south by the Tom Payne mine, on the east by the Pride of Bummerville, and on the west by the Matrimonial claim. It was first discovered in the year 1862 by P. Joyce and partner, who worked it for awhile with good results and then left it. Shortly after, Mr. Kincaid and others worked it for a short time and then abandoned it. Finally Messrs. Crosby, Ham and Herbert struck a rich chimney of quartz, and after working it to water, sold out to Messrs. Wickham & Gouldson, who developed the mine thoroughly by tunnel and shaft, receiving handsome dividends for their labor. After placing machinery on the mine Gouldson sold out to his partner, who worked it successfully for over a year, reaping a golden harvest. The owners concluded to quit it for awhile and perhaps in the near future to sink a new shaft with other machinery, but they never did so and in due time the shaft caved in to the surface of the ground. The mine was afterwards bought by G. Eberhardt, who has worked it successfully up to the present time. His present works are 150 feet north of the old shaft on a chute of decomposed quartz, 2½ feet wide, which prospects splendid.

Inyo.

THE GREENLY MILL.—Inyo *Independent*, July 12: Messrs. P. A. Chalfant and Geo. Thorpe are just in from Deep Spring district, where they have been engaged in constructing, and for the past month, in running the above named mill. Mr. Chalfant informs us that while some of the ores worked did not clean up to the big figures hoped for by the boys, not a single lot, worked from four different mines, but gave a fair margin of profits. Although not a single ton but was worked as it came from the mine—without any sorting whatever. With the exception of one small lot, the ores put through worked remarkably free, the only appliances at present in use at the mill for saving the gold being a complete set of fine amalgamating plates. In due time other appliances, particularly a concentrator, will be added, for use on both the gold and silver ores of the district. Mr. Chalfant says that while he does not claim to know of any wonderfully rich mines in the district, he does know of many that will as certainly pay a fair margin of profits as those that are worked, as most of them will be right along. At present he is confined to his bed by sickness, but barring delay on that account will, together with Mr. Thorpe, return immediately.

POLITA.—Mr. Wm. Irwin, Superintendent of the Polita mine, near Bishop creek, has now a force of seven men at work on the property, and will put another gang on in a few days. He says that if there is anything in the mine he will find it. He has been making arrangements to have the ore worked in the Hawley mill. From 600 to 800 tons of ore on the dumps, and work will be pushed in the mine.

NEW DISCOVERY.—It is reliably reported that there has been made recently a discovery of a large deposit of lead and silver ore about four miles easterly from the town of Keeler. The deposit lies at the southwestern end of the Buena Vista mountain, on which the celebrated Union Consolidated mine of Cerro Gordo is situated. The indications are that this discovery is of large extent and of good quality as to ores. The fortunate discoverers and owners are Nat Randall and W. R. Johnson.

INDEPENDENCE MINE.—Messrs. Wilson, McKenzie, Willis and Jerry Fitzgerald are getting out a lot of ore at the Independence mine at Darwin, to ship to Dayton. The vein is of immense extent and the ore carries a high percentage of metal. On the surface it is rich in copper, but, as in similar formations elsewhere, it is expected to contain lead and silver, with perhaps some gold, at a greater depth. Should the result of the first shipment of ore be satisfactory the proprietors will doubtless work the mine on an extensive scale.

MAXIM MILL.—The Maxim mill was started up last Monday morning. Mr. Nevins, who is in charge, says everything is running along smoothly, and the prospect for a good run is first-rate. The mine is looking well with plenty of ore in sight. It is the intention of the management to put in Frue concentrators at an early day.

SLATE RANGE MINES.—The suits in connection with these mines were called in the Superior Court on Monday, but by agreement of counsel were passed on the calendar for a period of sixty days. It is expected that an agreement will be had satisfactory to all concerned.

Mono.

STRIKE IN THE GREAT SIERRA TUNNEL.—Bodie *Free Press*, July 12: The Great Sierra Con. Silver Company at Bennettville closed down on the 3d instant. It is understood that the formation in the face of the tunnel indicated a close proximity of the ledge, and after the last shot had been fired the foreman looked at the result and immediately closed the tunnel. Priest, the Supt., was telegraphed for and work suspended. The total length of the tunnel is now about 1800 feet. About 15, miner's, inches of water is now flowing. The obnoxious gases and bad air have ceased entirely.

GORILLA.—Homer Mining *Index*, July 12: The outlook for the Gorilla M. and M. Co. was never so flattering as at the present time. Drift B, between the lower and middle tunnel, is carrying three ft of clean ore of good quality; another drift is carrying over two ft, and another has an 8-inch vein of very rich quartz. All the workings are looking well, and there is more ore in sight than the present reduction works can handle in two years. The bullion shipments are now as regular as those of the May Lundy. The new Planet mill has been on trial for several days, and is working admirably. Superintendent Winterhalter has constructed an automatic battery feeder by which he can have a mill feed itself at any rate desired—seven and one half pounds to the minute being the estimated maximum crushing capacity of the battery. So far it has been fed but 4½ pounds per minute, or 3¾ tons per day of 24 hours, and this it reduces to powder with a fraction over 1½ horse power. The discharge is excellent, and the little "Planet" turns in its orbit and crushes and grinds as gracefully as if it were a veteran at the business. There is now little doubt but it will come fully up to the claims of its inventor, A. E. Redstone. Work has been prosecuted in the Clifton mine for some weeks with very flattering results. The tunnel was run in 100 ft along the vein, and several tons of ore taken from this adit and reduced in an arastra last season gave an average return of $42.50 per ton. A winze, started midway of this tunnel, is now down 15 ft or about 60 ft (vertical) from the surface, and at this depth is in a body of fine ore, of which about 25 tons has already been sacked for shipment. In the bottom of the winze the fissure is fully six ft in width from wall to wall, showing a marked increase in width from the tunnel level. Fred Schwartz and John Flavia are making preparations to resume work on their Last Chance claim on the north fork of Rush creek, just south of Mount Lyell glacier, Prescott district. In the Last Chance location the vein has a uniform width of thirty ft of solid quartz, six ft of which is ore running from $100 to $4,200 to the ton. Horace V. Pullen, locator of the Lucky Saturday, a claim adjoining the Mount Lyell glacier, in Prescott district, will not begin work on that claim until about the middle of August, when he intends to take up supplies and prosecute work all next winter. The May Lundy mine is working something over one hundred men, and is yielding the usual quantity and quality of ore, with an abundance in sight in the various workings. The new crosscut into the Lake View, south of the old workings, is showing very rich ore. The bullion shipments are regular and the mill is running steadily and exclusively by water power. One pan is now kept running on tailings, and the new system of blanket sluices, riffles, etc., established by Mr. Brett, the new foreman of the mill, is so admirably arranged that nearly every particle of the gold is saved. The Bryant mine is now one of our regular bullion producers, the Butterfield mill having been thundering away on Bryant ore for a week. The mine is yielding a large quantity of high-grade ore, the largest force ever employed in the mine being now engaged in breaking down ore in the drifts on the 130-foot level. A large train of pack mules is engaged in transporting ore from mine to mill, each mule carrying 500 pounds at a load and making three trips a day, but this has proved inadequate, and more mules are to be put on the coming week.

STRIKE IN GREAT SIERRA—Homer Mining *Index*, July 12: As to the reported strike in the Great Sierra tunnel, Tioga District, it will be well to await reliable information, as outsiders are not yet allowed to know anything about the importance of the strike. That the Sheepherder lode has been cut into is certain; but there is nothing surprising or exciting in that fact, as such a strike was inevitable. As we understand it, but two series of shots were put into the solid quartz after it was reached, and no one but the foreman has been into the tunnel since the last series of blasts were exploded, and we doubt if even he has taken any steps to ascertain the value of the rock. At the tunnel level (which is only 751 feet vertically beneath the surface outcrop) the ore of the Sheepherder lode will probably be found much the same in the general appearance as at the surface immediately above, with a somewhat larger per centage of gold, and hence some appreciation in quality. No very rich silver ore in large quantities need be expected much above the water level proper, which is probably 200 feet or more below the tunnel level. No metalliferous vein has ever been found that carried a uniform quality of ore all along its course, and it would be a "scratch" if the Great Sierra tunnel should strike the Sheepherder in bonanza. On the surface, the ore is far richer about 300 feet south than at the line of the tunnel. The temporary suspension of work in the tuunel has no significance of consequence to the public.

Nevada.

NEW QUARTZ MILL.—Grass Valley *Union*, July 10: Henry B. Johnston and Wm. C. D. Body have entered into a co-partnership to build a custom quartz mill, which will be erected on the west side of Wolf creek, a little north of the old Gold Hill mill. It will be a ten-stamp mill, and run by water power. The mill will be commenced in a few weeks. Since the destruction of the McAuley mill and the tearing down of the old Gold Hill mill there has been no custom mill within the limits of the town, although there are four in the vicinity. The new mill is needed, and the location will prove a great convenience to prospecting companies.

A GOOD MINE.—Nevada *Herald*, July 12: The Ophir mine, at Grass Valley, so we learn, is at present paying its owners very handsomely. The Ophir is one of the old stand-bys of that place, and is regarded as a very valuable piece of property. We wish Grass Valley had a dozen of the same sort.

RIVER MINING.—Nevada *Herald*, July 14: The company of Chinese miners who have leased from the Manzanita Co. the bed of Deer Creek, from the suspension bridge to the Main street bridge, are still working away, and persons who have watched their clean-ups say they are doing very well. The water is turned by dams so that one-half of the creek can be worked out as deep as they intend, when the water course will be changed and the other half of the creek sluiced off. At present the Chinamen are working between the Broad and Main street bridges, at which point the tailings are from 10 to 20 feet deep. Besides the gold that is caught in their boxes, the heathens have found several watch chains and other articles of jewelry of greater or less value that have at different times been lost in the creek. Charles Adolph and partner are sluicing off the tailings above Main street bridge, near the Ice House. They struck one piece of ground that paid them from $20 to $30 a day. The tailings now being washed off pay them about $6 a day to the man, which is certainly very flattering, but as they have only a limited amount of ground to sluice, their good luck will soon be at an end.

Plumas.

BONANZA.—Greenville *Bulletin*, July 12: From Mr. Hall, we learn the following: "The tunnel has reached the ledge, and has been driven eight feet in the solid, and several ft in the soft formation. Mr. Dragovich has examined it and says the rock in the tunnel looks better than that on the surface, but as the ledge pitches into the mountain, and as the tunnel is hardly under the perpendicular of the ledge on the surface, he thinks there is not a doubt that a large body of ore will be on the other side of the soft formation. At present it is not known how large the vein is, but it is the opinion of Mr. Dragovich that it is a very large and permanent vein. In the Ophir Consolidated, tunnel, No. 3, which has been driven along the hangiug wall of the ledge 60 or 70 feet, is all in a decomposed quartz which carries considerable fine gold, the ledge itself showing some very good ore. Mr. Hall is well pleased with the prospect, and will drive the tunnels ahead in both of the claims.

ELIZABETHTOWN—*National*, July 12: Loring & Leavitt struck it rich in their east drift, one day this week, getting coarse gold and dirt that yielded about five dollars to the pan. One chispa weighed $22.50, and the most of the gold is coarse. This strike is a very important one, as it insures them at least seven or eight hundred feet of rich ground, and also proves that the Riverdale ground has the same channel. They are nicely fitted up, and will soon be making money rapidly.

Siskiyou.

PICK AND PAN.—The Russian claim on the North Fork of Salmon, 5 miles below Sawyer's Bar, is prospecting well. It is the intention of the owners to put up a saw mill in a few months for the purpose of obtaining lumber to build a new flume which will be three miles in length. Several men are employed in the mine at present. Mr. Olsen, of the above company, has just made a rich strike a half mile below the Russian claim, and will at once make preparations for working the new find. Mohr, Kline and Curran, on the North Fork of Salmon, are pegging away in their rich claim stripping surface dirt. They have water the year around and annually extract big pay. Gieschen and Kellner, below Sawyer's Bar, are building a new flume ½ mile long on Buckhorn Bar. Their ground was worked many years ago, but it gives up good wages notwithstanding. Biglen and Kline are opening up a river claim below the Gus Mohr mine, on the North Fork of Salmon, with excellent prospects ahead. It is considered the most favorable place on the river—the high banks on either side being formed of sloping bed rock, well calculated to concentrate the gold in the river below. Thos. Hickey and Sons, near Sawyer's Bar, have a good paying property, and they are working it in an energetic manner. They have one giant and moderately fair water privileges. They are engaged in cleaning up this week. Barry, James and Rundle, of Sawyer's Bar, have been ground sluicing for the past two months, and have realized from $7 to $8 a day to the hand. Myers and Kuchenbuch have 20 acres in course of patent on Paradise flat. Their profits have been very large for the past two years, and they base great expectations on this particular season. They have an inexhaustible supply of water and all the necessary paraphernalia for extensive operations. Monahan and Hutchinson, on the west end of Gold Hill, are drifting, making good wages, and hoping for better in the future. The water was exhausted before the Gold Hill Company succeeded in finishing the clean up, and it is hard to determine how the season paid. Fisher and Frank, in Eddy's gulch, are being favored with rich returns from their labors. Their claim has been in operation for the past ten or twelve years, and they have a sufficiency of ground lor a long time to come. Bill Burns, in the same locality, has a claim consisting of 13 acres of patented land, which never fails to liberally reward Mr. Burns for his untiring efforts. He is now engaged in cleaning up, and the results, so far, have been entirely satisfactory, although the season's water fell short. David Casey, of Eddy's gulch, ground sluiced all last winter, and is now working the bed rock with great success. Joe Frazer and company are cleaning up, and the prospect of a large yield is exceedingly flattering. Samuel Finley, at Sawyer's Bar, has sufficient surface stripped to furnish during the summer on pay dirt. He has completed a new flume. Charles Nickelt, in the old Doty drifting claim on Salmon is doing well. The claim pays about $34 per week to the hand. The country, ten or twelve miles up the North Fork of Salmon, promises to be a rich field for future mining operations. Gold in small quantities can be found most anywhere in that section, and a little prospecting will eventually uncover or lead to the discovery of some very rich deposits. Girrard and Burns are constructing a large ditch from Jackass gulch to the high benches back of the old Bastile mine. They have been engaged upon the work about a year, and it will take all of six months yet to complete the undertaking. Success is deservedly theirs. The Klamath quartz mine is running steadily on very fair rock, and the shareholders continue to receive a monthly dividend. Thirty-five men are employed, under the superintendency of James B. Tonkin. The Uncle Sam has probably suspended milling by this time on account of an insufficiency of water. The failure of water leaves the company with a large quantity of rock in the dump, which will be crushed this fall. The Uncle Sam has proven a perfect bonanza to Sheffield and Son. The Evening Star is being worked upon a small scale, the shareholders being desirous of testing the permanency and paying qualities of the lode before investing further capital. Mr. Robert Small, who was interested with Heartstrand and Bemmis in a quartz mine on French creek, sold his interest last week to Mr. Rosstetter. Four tons of rock crushed there a short time ago yielded six and a half ounces. The Montezuma, at Callahan, is cleaning up and will take out big money. The "Fortune" at Callahan has been in a hole all season; just getting out, and prospects are getting good. Mr. Crawford, on Kangaroo, is cleaning up, and the indications are that he will have a profitable yield. Mr. James Gould, an expert miner from Calico District, formerly of Salmon, is prospecting the quartz mines in the vicinity of Oro Fino. It is currently reported that he will run the A. M. Johnson quartz mill this season. The water is failing in Oro Fino district, and the miners are winding up for the season, with rather a short run. The Eastlick brothers have decided not to clean any bedrock this season, and will only clean up their flume. Wright & Fletcher are about through cleaning up. Campbell & Co. are still running with a good head of water, and will probably run from two to four weeks yet. They will no doubt make the largest clean up ever made in that vicinity, as the amount of ground worked this season is immense, and the prospects are remarkably good.

Shasta.

IGO ITEMS.—Cor. Shasta *Courier*, July 12: The Chicago mill is now running on sulphuret ore from the Central mine, the Hendy concentrator working quite satisfactorily. The free gold ore from the surface of the Chicago did not yield as well as expected. Some "chloride" ore is being taken out at another place that will probably give better results, the intention being to save the silver also. Ten tons from the Centennial mine will be tried for the silver contents by "free milling" process, and if successful, more ore will be taken out. Five tons of Kanaka ore is soon to be packed over and washed. The Crystal shaft is being cleaned out and retimbered to permit of examination by Red Bluff parties. If a satisfactory showing is made, the mine will be taken and worked in the good shape this excellent property merits. E. S. Ballou's arastra is running on Manzanita ore. The ground is too wet to do much but surface work at present. Water for power promises to be ahundant all summer. Smith has sold his interest to Robinson & Co., who have two men at work taking out ore. They also have men at work on the Central, taking out ore. The two mines keep their Cannon Ball mill running most of the time. J. B. Strong is taking out ore from the Atlantic, and working it at the Crum arastra.

San Bernardino.

CALICO DISTRICT.—Calico *Print*: A. G. Rhodes has just completed a contract on the New York mine, located in West Calico. The ledge of the mine runs parallel with that of the King, but is wholly independent thereof as will be seen by the assays given below. The mine was located by Mike Toohey and sold by him to Messrs. Hudson & Rose, of Los Angeles. Toohey received a contract from these parties and sunk a shaft on the mine of 102 ft, since which time the mine has been idle until this contract was given Mr. Rhodes. A drift was made from the bottom of the shaft 30 ft east and 12 ft west without getting through the ledge. The ore is spar and quartz, and two assays had are as follows: First, $211 gold, $3 silver; second, $65 gold, $2.25 silver. The ore, independent of the ledge on the surface, assays all the way from 120 to 480 ounces in silver. The porpbyry carries silver and the ledge gold. This no doubt is a valuable property and will probably set a great many of our prospectors searching for gold. The Lone Star mine, adjoining the New York, promises to excel the latter, judging from indications and assays already obtained. R. B. Johnson, lessee of the Sam Houston No. 3 and Blackfoot mines, has gone to Los Angeles and will return in a few days and put on a force of twelve or fifteen men to work these mines. In the first-mentioned mine a four-foot ledge has been uncovered and large quantities of $100 ore are seen on every hand in the various openings, and the results of recent developments have been so encouraging that Mr. Johnson can with considerable assurance promise to make returns in bullion that will attract no small degree of attention in our mining circles. Last week five tons of average ore sampled $113 to the ton at the Daggett Sampling Works, and a considerable quantity of this character of ore is on the dump. The Garfield mine started up again on Monday with its usual force of men, running out their usual amount of ore.

NEVADA.

Washoe District.

HALE AND NORCROSS.—Virginia *Enterprise*, July 12: The usual shipments are being made from the ore deposit on the 200 level. The Chollar bulkhead on the 2600 level was completed yesterday. When work will be resumed on the 2800 level cannot now be stated. It appears to depend wholly on orders below. The work done on that level, on the 4th, 5th and 6th of July, showed up well.

ALTA.—No work has been done in the east drift on the 2150 level since July 3d, on account of the appearance of water in the face. The diamond drill has been run in from the face of the west drift on this level a distance of about 300 feet. No water has

been tapped to the westward, and the ground appears to be of a favorable character.

MEXICAN.—The rock in the bottom of the winze below the 3200 level still blasts badly. But about seven or eight feet will be made this week. The rock is a sort of black bastard quartz, which is hard to drill, and in blasting blows out in pot holes. This winze is being sunk jointly by the Ophir, Mexican, Sierra Nevada and Union Consolidated companies.

BEST AND BELCHER.—The joint Gould and Curry southwest drift on the 2500 level is passing through a favorable formation of soft porphyry and clay, with some promising streaks of quartz. The joint Consolidated Virginia west drift, on the 1200 level, is being advanced at the rate of 26 feet per week, in a favorable formation of vein porphyry, clay and quartz.

CHOLLAR.—The bulkhead on the 2600 level was completed yesterday. Drifting on the main adit south is progressing well. It is expected to have the drift completed to a point 400 feet south of the north line on or about the 28th, after which a crosscut at right angles with the main adit, will be driven west to intersect the vein.

OPHIR.—Besides the work being done in the deep winze jointly with the other north end companies, the Ophir folks have started a drift on their 500 level from the main shaft, which will be run west to tap and train the old upper workings, in which water now stands to the hight of the 250 level.

SIERRA NEVADA.—No work is being done in the Sierra Nevada ground proper. Jointly with the Ophir, Union Consolidated and Mexican companies a winze is being sunk below the 3200 level in the ground of the latter company.

GOULD AND CURRY.—The joint Best and Belcher drift southwest on the 2500 level, is making good progress in a mixture of soft porphyry and clay, with streaks of quartz of a favorable appearance.

UTAH.—The south drift on the 1950 level is still passing through a favorable vein formation of quartz, clay and porphyry. There is no trouble with water and the rock works well.

ANDES.—The bottom of the winze shows but little change. The east drift is still in quartz of a favorable character. Some ore is being found that will pay for extraction.

POTOSI.—The work in this mine depends very much on that in the Choller, the two mines being very intimately connected as regards developments on their lower levels.

CONSOLIDATED VIRGINIA.—Some water beginning to show in the face of the south drift on the 2400 level. Work has been suspended at that point and the diamond drill put in.

UNION CONSOLIDATED.—The only work being done is that which is progressing jointly with other north end companies in sinking the deep winze in the Mexican ground.

CALIFORNIA. Owing to the appearance of water in its face, work in the south drift on the 2900 level has been suspended and the diamond drill put in.

YELLOW JACKET.—The usual amount of ore is being extracted and sent to the mills. The exploring drifts are showing very well.

CROWN POINT.—Sufficient ore is being extracted to keep the mills on the river running to their full capacity.

Arabia District.

ORE SHIPMENTS.—*Cor. Silver State*, July 8: The mining industry is looming into prominence in this vicinity. Last week George Lovelock shipped five carloads of ore from Arabia District to the Palisade reduction works; also one carload of nickel and cobalt salt to San Francisco from the Cottonwood mines. Mr. Lovelock received an advance of $1,000 on the nickel ore, which is to be shipped to Swansea, England. J. W. Mills is shipping ore from the Humboldt Queen mine to the Mill City reduction works, and he has contracted with N. P. Davis to haul 500 tons of ore from the mine to the railroad. Four carloads have already been shipped from the mine to Mill City. Messrs. Tangerman & Ried are repairing the gold mill in Limerick Canyon, and as soon as they get it in running order it will start upon ore from the Hope & Bennett mine.

Central District.

OPENING MINES—*Silver State*, July 8: Ex-Senator M. S. Thompson says Central District, west of Mill City, is coming to the front as a mining camp. Several men are engaged in opening mines there and the prospects are good for a lively camp. Frank Clark sent two tons of ore to San Francisco from the railroad mine, to test the quality of the ore, and it netted him $260 per ton. The ore, besides silver, contains 22 per cent. galena, and there is plenty of it. The Marietta mine, owned by Mr. Thompson is prospected to a depth of 320 feet, and looks well in the lower works. The owner intends to have a lot of ore worked at Mill City, when the new reduction works at that place start up. The heavy discount on silver is rather discouraging to miners, who complain that while the Government is deriving millions of dollars profit from the proceeds of the miners' labor, they have to lose from ten to fourteen per cent on every bar of bullion they produce.

Esmeralda District

AURORA REVIVING—*Walker Lake Bulletin*, July 8: Aurora is a camp that will not stay in the dumps. Nothing about that town remains in the dumps except the waste rock and an occasional piece of rich ore which has been overlooked. Several of the mines are now doing well and the citizens are jubilant over the prospect of the resumption of old time activity. Judge Seawell and John Neidy are working the New Esmeralda to advantage. A short time since a working sample of their ore was milled and the result assures a profitable result to their enterprise. The Silver Lining, the Poor mine and others are also doing well, and, while not making much noise, Aurora is getting ready to stand near the head of the list of the bullion producers. McKinlay, of Aurora, appreciates the advantage of paying good miners good wages. He has been, for some time, working a mine in that camp and is paying $4.25 per day to his men. The result is that he gets the best men in the country and each of them takes as much interest as though he was an owner.

Ophir Canyon District.

GOOD NEWS.—Eureka *Sentinel*, July 12: It will be gratifying to many old-time miners of Eastern Nevada to hear good news from Ophir Canyon, a district in which much confidence has always been felt, though in the earlier and high-pressure days, its mines were not made to pay. M. J. Curley and the Schmidtlein brothers are taking out some very rich ore in the Rising Sun mine. The Grizzly and Cameron Mining Companies also have rich mines of gold bearing quartz. The owners of the mines are James Crookshanks, John Foster, Henry Warne and Patrick Lenard. The Gold Point, another flattering prospect, is situated about a quarter of a mile from the Twin River Mining Company's mill. It is owned by M. J. Curley, Jr., and Mrs. Annie Ripley. They have several tons of first-class ore on the dump, and enough more in sight to keep them busy a year. The Morning Star has a four-foot ledge, which will run from $100 to $200 a ton. M. J. Curley is the fortunate owner of this mine. There is another mine at the Summit of Ophir Canyon, the ore of which will go from $400 to $1,000. This belongs to Michael Timlin, of Austin, and Mr. Rogers, of Smoky Valley. They will set men to work shortly opening up their property.

ORE SHIPPED.—Battle Mountain *Messenger*, July 12: Patrick Lenard, who left here about a week ago with a carload of ore from Ophir Canyon for Salt Lake, returned yesterday. His assays show an average of $160 per ton in gold. Mr. Lenard is highly pleased with the returns, and says he has a fortune in his mine at Ophir.

Tuecarora District.

ARGENTA.—*Times-Review*, July 10: South crosscut on the 400 level is in 168 feet.

CENTRAL CON.—South crosscut extended 20 feet. No change in formation. Water stronger.

NORTH BELLE ISLE.—North drift, 70 level, advanced 8 feet. There is some improvements in the width and grade of the ore in the past week.

BELLE ISLE.—Work has been connected on the line crosscut to the East vein, 150-foot level.

GRAND PRIZE.—South drift on the 200 level has been advanced 11 feet during the week, and work for the present stopped there. South drift on the 300 has been advanced 27 feet, and work resumed in face of South drift on 400. The stopes above the 400 are producing some good ore, and above the 300 the ore is rich.

NAVAJO.—On the 250 level, the south drift on the "east" vein, has been extended 6 feet. Work has been commenced on winze, at the end of North drift from No. 2 crosscut, "east" vein, 150 level. No. 2 crosscut, is 240 feet south of No. 1 cross-cut, same level, or 345 feet south of the Belle Isle line. The vein at all points is in high grade ore. There is nothing material to note in workings at other points. The usual work has been forwarded at the mine and mill.

White Pine District.

EBERHARDT.—*White Pine News*, July 5: Reports reach us from Hamilton that the Eberhardt Company are meeting with very encouraging prospects in Treasure Hill. The burleighs have again been set to work. The formation in the Jennie A, at White Pine Mountain, is also said to have undergone a change for the better. Lively quartz, carrying silver, has been struck in the lower workings of that mine.

ARIZONA.

COPPEROSITY MINES—*Cor. Onijoloa Prospector* July 8: The Casa Grande Copper Company received two copper smelters last week which they are forwarding to the Copperosity as fast as possible. They are the famous water-jacket smelters made by Rankin, Brayton & Co., of San Francisco, and are perfect in every particular. It will be but a very short time before these smelters will be producing bullion, for Supt. Hillings is pushing operations with all possible speed. He has about completed a pipe line from the Copperosity to the Vekol basin, where Messrs. Summers & McGonigle have recently bored a well which it is estimated will furnish all the water necessary, as the supply appears to be well-nigh inexhaustible. The Copperosity is developing into a fine property—large bodies of high-grade ore having been found recently in the lower workings. Considerable work is being done in different parts of Casa Grande district, and the prospect of lively times this fall is very flattering. The following is a report of development work on the Ben Nevis mines for the past week: Tunnel No. 1 is in 217 feet in a better working formation than formerly. Crocker tunnel No. 5 has been advanced to 61 feet. Stringers of ore have been cut which give excellent assays. The winze has reached a depth of 121 feet. The bottom of the shaft is in a fine porphyry. South drift from tunnel No. 2 is in 110 feet, with no material change in the formation from last report. Peer tunnel has been progressed to 239 feet.

COLORADO.

LAWSON MINES.—Colorado Mining *Gazette*, July 5: Red Elephant mines are doing well. Kennick & Irvin's ore mill-runs, first-class, $240; second-class, $120. There are from eight to twelve inches. It is on the White lode. Putt & Co., on the White, have a 10-inch streak of ore. It is on the Soyster streak and runs $113, one class. Longrace & Gates, west of Putt & Co., are raising and have from two to six inches of ore, which mills, first-class, $165; second-class, $85. Potter Brothers are working under Putt & Co., and Longrace & Co., in the Schwartz shaft. Their streak averages from six inches to one foot, which runs, first-class, over 200 ounces silver per ton; second-class, over 90 ounces per ton. Pat. Holland, working on the Free America Extension, first level, has a fine streak. Gates & Co. are drifting on the third level of the extension, and have a wide paystreak. Hugh Rehan, on No. 3, of the Joe Reynolds, has a fine streak of high-grade ore. O'Connell & Co. are doing well, as are Lewis & Co., on the Murray mine. On the Joe Reynolds, No. 3 Chopin, Holley & Co. have a good streak in the slope. They have two feet of solid ore. Hanning & Harris have leased the Free America Extension lode, and have twenty-six men at work now under lease. Wit Mulchan & Co. are running a crosscut, down the hill from No. 2 level of the Extension, to cut a lode forty-five feet south of the Extension, and when cut they expect a bonanza. Everything is looking as if the hill will boom as in 1878-9. Coontz, the owner of the Little Giant, has the finest streak on the hill. Ore runs, first-class, $532, and a very good size, which makes him sanguine. Three carloads of ore shipped by Moore & Co., from the Joe Reynold's mine, netted $8,000.

BIG STRIKE ON FREE GOLD HILL.—Chaffee *Times*, July 8: Just sixty ft west of the west line of the Free Gold mine, which is the oldest worked claim on that hill, and out of which nearly $10,000 in gold was taken in 1878 and '79, is an astonishing bonanza. Charles Simpson, A. D. Terry and their partner, whose name we cannot now learn, staked, about sixty days ago, the "Etty," but encountered nothing encouraging until about 15 ft deep, when they found the ore so liberally sprinkled with free gold that it was visible on every piece taken out. A handkerchief full of the ore panned 50 cents in gold, and that by a very imperfect, crude process. The shaft is even now only 20 ft deep, but the vein is fully 4 ft and shows a vast body of ore. On Monday morning the boys were offered $1,000, but declined. Visitors have been plentiful on the ground and quite a little stir was occasioned. The claim is evidently on the same vein with the "Worthy Chief Templar," which shows so many pieces of ore, besprinkled all over and all through with gold. The Colorado Mining and Land Exchange is now negotiating to get machinery to work the ore of both claims.

LEADVILLE.—*Herald*, July 8: The Logan and Derry mine is being worked by a number of leasers. Grading for a new mining plant on the Minnie mine has been commenced. The Oro and Antioch quartz mills are both running—the former on Nellie S. and the latter on Florence mine gold ore. The owners of the El Capitan have contracted with the McClelland mill, for the treatment of 200 tons of ore from their mine. Mr. Robert O'Neil made a trip on Musquito range the other day, and reports lots of snow still covering large sections of that range. Mr. Gilbert, of the Iron Hill Consolidated, at Red Cliff, shipped a carload of ore the forepart of this week, which netted him $2,270. The mineral was extracted from the quartzite. The new Cash Creek working flume, 36 inches wide and 8,200 ft long, of the Twin Lakes hydraulic syndicate, is almost completed, and will be in working operation by the first of the week. Mr. J. A. Walsh showed the reporter a settlement with the smelter for thirty-five tons of ore, recently shipped from the Consolidated Virginia mine on Sugar Loaf mountain, six miles west of Leadville. The lot brought $3,594 after deducting smelting charges, or $71.30 per ton.

IDAHO.

ANOTHER ORE PRODUCER.—Wood River *Times*, July 8: Ore has commenced coming from the Mountain View mine, near Bullion, and the fourth carload left Hailey yesterday. It sold on a basis of 234 ounces silver per ton, and 56 per cent lead. Now that the stream of ore has commenced running from this mine, it will doubtless not run dry for years. Mose Hirschman, Barney Quigg and Judge McBride are the owners of the Mountain View.

OVER $200,000 IN SIGHT.—William Boyd, one of the owners of the Bates & Boyd group of mines, near Bullion, was in town yesterday, and informed Jos. Wurtzburger that he had between 15 and 20 men at work on ore that averages over 200 ounces to the ton. Careful computation shows over $200,000 worth of ore in sight in the Bates & Boyd. Mr. Boyd was formerly engineer at the Flagstaff mine, in Utah, and his old friends will be glad to hear of his good luck.

ELKHORN ORE.—During the past few days the leasers of Elkhorn ground have been having their ore hauled to Hailey, whence it is shipped to the smelters. They will continue to ship between 20 and 30 tons per day until they have brought all their ore down. They have between 230 and 250 tons which, they think, will average them $90 net per ton. This comes from ground of which they had undisputed possession. Out of some disputed ground a large quantity of ore has been extracted which the leasers claim to have discovered and owned, but the ownership is the subject of a lawsuit in the District Court.

THE CONCENTRATING WORKS.—The new concentrating works just erected by Jabez Chase & Co. at the smelter site at the mouth of Indian creek, has finally been got in first-class working order, and started in to do regular work. It is, therefore, one of the industries of Hailey. The owners are experienced mining and mill men, who will treat all who intrust their ores to them fairly, and they will do good work at fair rates. Mr. Chase will leave in about a week to erect the concentrating mill of the Silver King mine, and remain at Sawtooth for the balance of the summer. When he goes Milton E. Pinney will assume charge as Superintendent of the Hailey Concentrating Works.

MONTANA.

BUTTE BONANZAS.—*Inter-Mountain*, July 8: The Lexington company employs 300 men, and reduces monthly about 1,500 tons of ore, which pulps in the mill between $55 and $60 per ton. The Mountain View is now making regular shipments of copper ore to Baltimore, and promises soon to be second only to the Anaconda and St. Lawrence in the amount of its crude exports. Patents have been granted for 1,392 mineral claims in the Butte district. This fact speaks eloquently for the mineral wealth by which the Queen City of the Rockies is surrounded. Sinking is actively progressing on the Montana company's Parrot claim. No time will be lost in reaching the 300 foot station. The Lexington vein has not yet been cut by the 650 foot south cross-cut. The Harris tunnel now has a total length of about 1,150 feet. A winze, 800 feet from its mouth, is down 100 feet on a vein of good looking silver ore. Another winze is being sunk near the face, which also shows an excellent quality of ore in the bottom. The Dexter mill, working on ore from the Orphan Girl, is producing more bullion, in proportion to the number of stamps, than any other mill in the district. The south vein of the Alice continues to produce an abundance of fair grade rock, but the supply from the main workings is limited. The Magna Charta keeps up its record, but the expenses of its operation are high on account of the separation of the ore bodies. If the 1st, 2d and 3d south veins should unite at a greater depth, but little comparative expense would attend the extraction of ore, and the output and profits would be proportionately increased. Mr. Julian Smith has charge of the improvements now being made at the Colorado smelter, where a very commodious building is being erected for the new rock breakers, Cornish rollers, etc. A Denver man, representing Mathews & Webb, ore brokers, has been making investigations for the past ten days concerning the feasibility of ore sampling works. Owing to the present situation of affairs and the probable opposition of the smelting companies, the outlook is not considered encouraging for the project. The Moulton mill is working some custom ore from the Poser, which, on the 150-foot level, is looking well in both the east and west drifts, and producing a good deal of ore from the stopes. The Original is not now in very active operation, but some new ground is being explored. The ledge is somewhat broken up on the 400-foot level. Sinking is vigorously progressing from the 100-foot station of the Orphan Girl. A force of seven men is employed on A. W. Barnard's placer claim, and the clean up this year promises to be larger than at the close of any previous season during the past five years. The Clear Grit shaft is down 275 feet. It is predicted that the cross-cut from the 320-foot station will expose one of the strongest and most extensive silver-copper ore bodies in the district.

SILVER.—Butte *Miner*, July 9: A pleasant sight to behold, and one profitable to the stockholders, was to be seen in the Alice office yesterday. Twenty-seven silver bricks, averaging 95 pounds avoirdupois, were displayed upon the shelves of the large safe in the company's office. These were the product of a nine day's run. Take courage all ye Alice stockholders. At that rate you will soon be rich. Superintendent Hall says the mines belonging to this company are looking better now than they have ever done. We learn from authority, though names are withheld, that negotiations are in progress for the sale of a mine near Butte, that has up to this time not been considered first-class, and is not well known, at the price of $350,000. The same authority states that the owner would not now sell if he were not in debt. An expert says that there is now at least half a million in sight in the mine. The owner is to be congratulated. This sudden step from poverty to a condition in which one can know where the cash is to pay for his breakfast is too utterly too too to contemplate. We understand from Mr. Louis Demer that the more work is done on the Granite Mountain of Philipsburg, the better it shows. It is worked, not by a shaft, but by tunnels run into the mountain. There are now three of these tunnels in operation. The lowest of these taps the lead at the depth of about 500 feet. The ore is very rich. This is the mine that yielded $265,000 from 1,500 tons of ore.

ONE THOUSAND OUNCES IN GOLD.—*Herald*, July 8: Yesterday the Merchants' National bank received one thousand ounces of gold retort from the Homestake mine, on Virginia creek, which can be seen to-day in the window of the Merchants' bank, a tempting batch of golden fruit labeled "Montana turnips," four in number. The Homestake gold mine, some twenty miles from Helena, is the property of Wm. Negus and Henry Jacobs, which they profitably work with a five-stamp mill. The thousand ounces gold retort is the product from one hundred and fifty tons of quartz and are worth $14,000.

NEW MEXICO

GOLD BRICK.—Silver City *Enterprise*, July 4: The Carlisle mining company shipped a gold brick valued at $14,000. It was the result of a fourteen day's run. On the 30th ult. the magnificent new reduction plant of the Arizona Company, at Clifton, was completed. The water was turned into the turbine wheel from the flume, full force, and the entire machinery in the plant set in motion. The machinery was also run by steam power and everything works to a charm. Two sixty-ton smelters will be blown in on Monday and three more during the week. There is a much better feeling here than has been in a year, and everyone is confident that the company will make a success and realize handsomely on their big investment. The Pinos Altos Gold and Silver Mining company's mill at Pinos Altos started up on Sunday last, and has been running on regular time ever since. It is one of the most complete and best arranged 10 stamp mills in the country. The company have enough ore on the dump and in sight in their mines to keep the mill pounding away for two years. The ore averages $17 per ton. The company also have from 4,000 to 6,000 tons of mill "tails" on hand, which are estimated to contain $80,000. They are being run through the stamps and over the vanners at the ratio of about five tons of "tails" to ten tons of ore. From this time on the Pinos Altos Gold and Silver Mining company will be a regular producer.

UTAH.

REVIEW.—Salt Lake *Tribune*, July 11: The week has been a fair one in the movement of the metals. The roads in the canyons and hills are getting once more in passable condition. The receipt of bullion and ore in the city for the week ending July 9th, inclusive, were as follows: Bullion, $131,885.53; ore, $3,800; total, $135,685.53. The shipments of the Horn Silver Company for the week aggregated twenty-three cars of bullion, $69,000; making the year to date, $1,220,000. Sales of Horn Silverstock in New York, 2,408 shares for the week ending July 3rd, at the following prices: June 28th, $5.25; June 30th, $5.13; July 1st, $5 38; July 2nd, 5.25; July 3rd, $5.25. The shipments of the Ontario for the week were forty-two bars, $29,817.17; total for 1884, to date, $827,449.46. No sales of stock reported from New York. The output of the Hanauer smelter for the week was nine cars of bullion, $19,600. The Stormont sent up two bars of silver, $3,985. Two cars of Day bullion were received, $9,483.36. One lot Nevada ore came in, valued at $750. Our advices from all the mining centers are to the effect that great activity prevails everywhere, with unusually good prospects for a prosperous season.

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Ingersoll, D2 3", beat National 3½"	.505	" "
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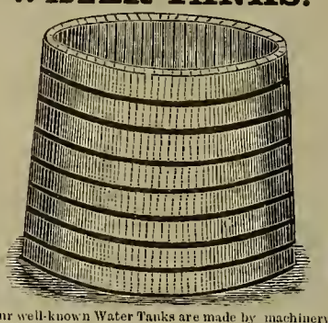

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McCaskell's Patent Car Wheels and Axles—Best in Use.

New York Office, Walter McDermott, Manager, Room 32, No. 2 Wall St.

F. A. HUNTINGTON,
SAW, SHINGLE, AND QUARTZ MILL MACHINERY.

We Call Attention to the Following Testimonials as to the Capacity and Durability of the Centrifugal Roller Quartz Mill:

SAN FRANCISCO, Dec. 27, 1883.

Mr. F. A. Huntington, San Francisco, Cal.

DEAR SIR:—The four-foot Centrifugal Roller Mill, bought of you in August, 1882, for the Whidden Gold Mining Company, of Shingle Springs, has given entire satisfaction, both on our own and on custom work, saving from 85 to 90 per cent of the gold in the mill. In conclusion I will say that we are so well pleased with it that Mr. Whidden and myself are putting one of the same size on the Tohongo gold mine, near Ravenna, in Los Angeles county.

Yours truly, P. VEASEY,
34 California St., S. F.

FINE GOLD GULCH, Nov. 10, 1883.

Mr. F. A. Huntington, San Francisco, Cal.—DEAR SIR:—In reply to your inquiry concerning the working of your Centrifugal Roller Quartz Mill, I am pleased to say that I run one of them for seven months, doing custom work on different varieties of rock, and that the mill gave satisfaction in every respect, and did all that you claim for it.

Yours truly, BYRON JENNINGS.

CARIBALDI MINE, Dec. 17, 1883.

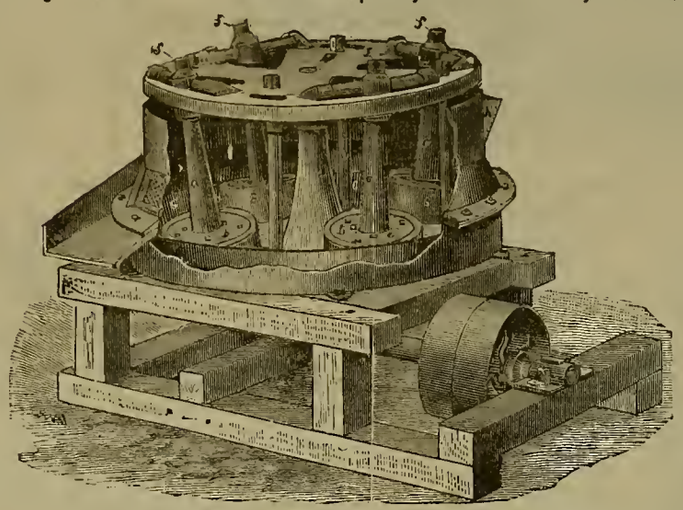
F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR:—In reply to yours of the 10th inst., I take pleasure in assuring you that your Centrifugal Roller Quartz Mill gives entire satisfaction, and I can heartily recommend it to mining men who want a cheap and efficient crusher.

Yours truly, E. I. PARSONS, Supt.

32 WASHINGTON AVENUE,
SAN FRANCISCO, Dec. 29, 1883.

F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR: Having run one of your Centrifugal Roller Quartz Mills on sample lots of rock from more than twenty different mines, I must say that in every instance it has given the best of satisfaction in every particular; and I recognize its superiority over any other mill manufactured.

Very truly yours, D. O. MOWRY.



CENTRIFUGAL ROLLER QUARTZ MILL.

The work done by the Centrifugal Roller Quartz Mill, during the past two years, on various mines and different kinds of rock, PROVES ALL THAT IS CLAIMED FOR IT, viz.:

1. The cost of same capacity is not more than one-half that of stamps.
2. Freight to mine one-fourth that of stamps.
3. Cost of erection at mine one-tenth that of stamps.
4. It runs with one-third the power per ton of ore crushed.
5. The wear is less than that of stamps.
6. The wearing parts are easily duplicated.
7. It has a much better discharge, and leaves the pulp in better condition for concentrating.
8. It is a better Amalgamator, saving fully nine-tenths of the gold in the mill; the balance can be saved on plates in the usual manner.
9. It is continually crushing; not like the stamp, using power to suspend it in air ninety-nine one-hundredths of the time and the balance making a thundering noise, and accomplishing *comparatively* small results. It is as far in advance of the stamp mill as the present method of making flour with improved rolls is over the Indian's mode of crushing corn in a stone mortar.

PATTEN'S CONCENTRATOR.

This machine requires less power, less care or attention, and is less liable to get out of repair than any concentrator now in use; all of which any practical miner will comprehend when seeing it in operation.

SONORA, CAL., Dec. 1, 1883.

F. A. Huntington, Esq., San Francisco, Cal.

DEAR SIR: In reply to yours of recent date, inquiring about the Centrifugal Mill which I bought of you, I will say that I have run the mill four months on hard rock; and I take pleasure in adding that the mill has in every way given the best of satisfaction.

Yours truly, J. H. NEALE.

CARIBALDI MINE,
Calaveras Co., Cal., Dec. 17, 1883.

F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR:—In answer to your inquiry concerning the working of the five feet Centrifugal Mill, bought of you for the Caribaldi mine in Calaveras county, I take pleasure in saying it gives entire satisfaction in every respect, and I only regret that the mine does not warrant the purchase of more of them and the continued use of the one now in operation.

Very truly yours, D. B. SMITH.

F. A. Huntington Esq., San Francisco, Cal.—DEAR SIR—Your Centrifugal Roller Quartz Mill has run on the Whidden Gold Mining Co. property at Shingle Springs, El Dorado Co., Cal., about four months, and it has done good and satisfactory work, a greater proportion of gold remaining in the mill than in the stamp battery. FRED JONES, Supt.

HILDRETH RANCH, Fresno Co., Cal.,
January 11, 1884.

F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR—In regard to your mill (Centrifugal Roller), I have crushed about 500 tons of rock in the mill, and am glad to say that it has given entire satisfaction, and can recommend it to the public as the most expeditious and least expensive method for crushing and milling ore that I have ever seen. Truly yours,

THOS. HILDRETH.

MILLS ERECTED WITH ALL APPLIANCES COMPLETE. CAPACITY AND DURABILITY GUARANTEED

F. A. HUNTINGTON, 45 Fremont St., San Francisco.

☞ SAMPLE LOTS OF ORE WORKED. ☜ ☞ WHERE A MACHINE CAN BE SEEN IN OPERATION. ☜

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17 AND 19 BEALE STREET,

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18. 20. 22 AND 24 MAIN ST.

DUNHAM, CARRIGAN & CO.

..... Dealers in .....

MACHINISTS' & MINING SUPPLIES

HARDWARE, IRON, STEEL,

PIPE, TUBES, ETC.

SAN FRANCISCO.

PACIFIC POWER CO.

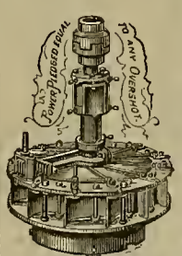
Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in building. Apply at the Company's office, 314 California street.

JAS LEFFEL'S TURBINE WATER WHEEL,

The "Old Reliable,"

With Important Improvements, making it the

MOST PERFECT TURBINE NOW IN USE



Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.

Those improving water power should not fail to write us for **New Prices,** before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address

JAMES LEFFEL & CO.,

Springfield, Ohio, and 110 Liberty Street, New York City

PARKE & LACY, General Agents, **21 & 23 Fremont St., S. F.**

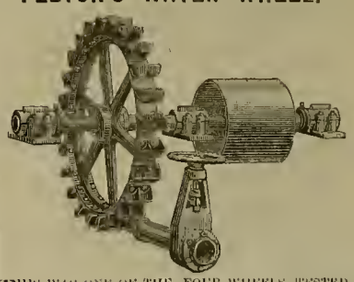
THE JENKINS STANDARD PACKING

IS ACKNOWLEDGED BY USERS AS THE BEST in the world. Unlike all other Packings, the **Jenkins Standard Packing** can be made any thickness desired in a joint by placing two or as many thicknesses together as desired, and following up joint, it vulcanizes in place and becomes a metal of itself (it is frequently called Jenkins Metal), and will last for years, as it does not rot or burn out. Avoid all imitations, as a good article is always subject to cheap imitations. The **genuine** has stamped on every sheet "**Jenkins Standard Packing,**" and is for sale by the Trade generally.

Manufactured only by

For Sale by DUNHAM, CARRIGAN & CO., San Francisco, Cal. | JENKINS BROS., 71 John St., New York.

PELTON'S WATER WHEEL.



THIS WAS ONE OF THE FOUR WHEELS TESTED by the Idaho Company at Grass Valley, Cal., and gave 90.2 per cent., distancing all competitors. Send for Circulars and guaranteed estimates.

L. A. PELTON,
Nevada City, Nevada Co., Cal.

AGENTS—PARKE & LACY, 21 and 23 Fremont Street, San Francisco, Cal.

NICKEL and COBALT.

For Sale

12 LARGE CLAIMS, going from 14 per cent. up to 45 per cent. Situated in Cottonwood, Churchill county, Nevada, 40 miles east from Lovelock Station, C. P. R. R., Nevada, U. S. Ore is being shipped by car-load to London, England. Apply to

GEORGE LOVELOCK,
Lovelock, Nevada, U. S.

Dewey & Co. { 252 Market St } **Patent Ag'ts.**

Sedim n' B ring Streams in Europe.

At the last meeting of the Technical Society of the Pacific Coast, Mr. Geo. J. Specbt, read a paper "On the Treatment of Torrential Sediment-Bearing Streams in Europe, and its application to California." The paper was very fully illustrated with diagrams and large photographs of the improvement works on the rivers in France. In Southern Europe, where the devastation of the valleys by mountain streams, in consequence of deposits of detritus, has been immense; the evil has been remedied successfully by simple and comparatively cheap means These cousist mainly of so-called "thalsperren" (retaining and consolidating dams), either of masonry or of hurdles and fascines, by the replanting of forests and by seeuring the slopes by ereating vegetation upon them. The work is done by the Government, or by private individuals or associations, with subsidies from the Government. Mr. Specht described with some detail the system earried out by the French Government to retain the debris. They build small brush dams all along the the streams at such places where sediment occurs. They adopt the system of holding back the sediment in small quantities, not letting large accumulations occur. The photographs showed how their works were constructed. From year to year they raise the bed, but confine the debris in the stream. Large tracts of land are reclaimed and villages prevented from destruction by debris. It may he stated that the debris occurs not from mining, but because the land has been denuded of plant-life by sheep and goat pasturing, so that heavy rainfalls result in vast quantities of debris passing down the stream.

When the dams are completed trees are planted on the hillsides. The forests newly planted are exempted from taxation for thirty years, and no trees arc allowed to be cut for a period of twenty years after the commencement of the improvement works. The use of the field for pasture is subjcct to regulation made from year to year in order to prevent inconsiderate destructiou of vegetation. Instances were cited where a small outlay had secured large profits. The government had spent large sums, but found the returns greater than the expense in putting land in condition for agriculture where formerly the dcbris laid waste large tracts.

Mr. Specht drew some conclusions iu reference to the solution of the debris question in California, by about the same means, changed and altered according to local circumstances. He empbasizes the principle that the evil should be attacked at its very sources, and that the whole work should be carried out according to one well-planued and thoroughly studied project, by and under the control of the Government. The investigations and improvements should uot be restricted to the mountains, but should include the valleys and the swamp and over-flowed lands. The money to do this work should partly be raised by the State and United States, and partly by a general State tax, which latter is justified as the permanent improvement of the navigable rivers will raise the value of property in the entire State. The hydraulic mines would be allowed to continue their work, but he restricted to a certain amount annually, which shall be determined from year to year in accordance with the amount of detritus. The water of the winter rainfall should be stored in reservoirs located in the mountains, and the water should be allowed to run off only in accordance to the carrying capacity of the rivers. The paper will be published shortly by the Technical Society in its proceedings and will be read with interest, showing, as it does the experience of other countries with a problem of great importance to us in California.

Bullion Shipments.

Day, July 8, $9,483; Horn Silver, 8, $18,000; Ontario, 8, $4,676; Hanauer, 8, $6,400; Stormont, 8, $3,985; Crescent, 8, $3,050; Hanauer, 9, $4,600; Horn Silver, 9, $12,000; Ontario, 9, $5,937; Horn Silver, 20, $9,000; Ontario, 10, $5,144; Hanauer, 11, $4,000; Horn Silver, 4, $3,000; Ontario, 12, $9,230; Bodie, 8, $6,346.46; Bonanza King, 11, $7,356.79; Contention, 11, $10,634.94; Navajo, 14, $8,000.00; Syndicate, 1, $7,603.76; Standard, 7, $6,829.74.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiviug accessions of new fish and other marine life. The number of seations is increased, and there is a better chance to study their actions The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward' Gardens is a day well spent.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M Co	California	5	1.50	June 23	July 28	Aug. 14	A. Judson	320 Sansome st
Alpha Con M Co	Nevada	18	50	July 16	Aug 21	Sept 10	W Willis	309 Montgomery st
Belmont M Co	Nevada	37	15	May 26	June 30	July 28	J W Pew	310 Pine st
Bodie Tunnel M Co	California	9	20	June 30	Aug 2	Aug 30	C F Harvey	309 California st
Butte Creek Hyd. M Co	California	9	10	May 14	July 10	July 30	E L Taylor	230 Montgomery st
Best & Belcher M Co	Nevada	30	50	July 9	Aug 14	Sept 2	W Willis	309 Montgomery st
California M Co	Nevada	12	20	May 20	June 27	July 24	C P Gordon	309 Montgomery st
Columbus Con M Co	Nevada	3	25	June 2	July 7	July 28	J M Buffington	309 California st
Champion M Co	California	15	10	June 13	July 17	Aug 6	T Wetzel	322 Montgomery st
Enterprise M Co	California	1	15	July 1	Aug 15	Sept 5	W Van Bokkelen	419 California st
El Dorado Con M Co	Nevada	14	2.00	July 14	Aug 14	Sept 4	D M Kent	330 Pine st
Excelsior Water Co	California	6	50	Jan 29	July 1	July 29	H B Wheaton	215 Sansome st
Golden Channel Drift M Co	California	1	03	May 22	June 23	July 23	A B Paul	328 Montgomery st
Gould & Curry S M Co	Nevada	48	50	June 6	July 11	Aug 4	A K Durbrow	309 Montgomery st
Humboldt Hill M & M Co	California	1	15	July 15	Aug 19	Sept 5	J Stadtfeld	419 California st
Mayflower Gravel M Co	California	25	10	July 10	Aug 13	Sept 5	J Morizio	328 Montgomery st
Mammoth Bar G M Co	California	6	15	June 9	July 11	Aug 1	J W Pew	310 Pine st
Mexican G M Co	Nevada	27	75	June 11	July 16	Aug 6	C E Elliott	309 Montgomery st
Mono Lake H M Co	California	1	50	May 19	July 2	July 21	J C Winans	331 Montgomery st
Morgan M Co	California	1	1.00	June 7	July 11	July 30	C S Neal	309 Montgomery st
Mono G M Co	California	21	50	July 8	Aug 12	Sept 1	G W Sessions	309 Montgomery st
North Peer M Co	Arizona	1	2.00	June 12	July 17	Aug 11	H Dean	309 Montgomery st
Pittsburg M Co	California	10	05	July 11	Aug 15	Sept 5	C F Brooks	210 Front st
Peer M Co	Arizona	1	25	June 6	July 15	Aug 5	A Waterman	309 Montgomery st
Potosi M Co	Nevada	15	25	May 29	July 1	July 22	C L McCoy	309 Montgomery st
Real Del Castillo M Co	Mexico	2	20	June 28	Aug 4	Aug 22	A Judson	320 Sansome st
Rainbow M Co	California	11	15	June 16	July 21	Aug 18	P F Mohrhardt	311 Montgomery st
Starlight Co	California	1	06	June 14	July 15	Aug 6	W Buttles	513 Market st
Silver Hill M Co	Nevada	20	05	June 2	July 8	July 29	W E Dean	309 Montgomery st
Scorpion S M Co	Nevada	18	10	June 25	Aug 1	Aug 22	G S Spinney	310 Pine st
Union Con M Co	Nevada	27	50	June 9	July 14	July 31	J M Buffington	309 California st
Utah S M Co	Nevada	49	50	June 19	July 25	Aug 13	C Pratt	309 Montgomery st
Valapara M Co	Mexico	2	20	June 28	Aug 4	Aug 22	A Judson	320 Sansome st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Benton Con M Co	California	W H Watson	323 Montgomery st	Annual	July 30
Lady Washington Con M Co	Nevada	W H Watson	328 Montgomery st	Annual	July 30
Mammoth Gold Bar M Co	California	J W Pew	310 Pine st	Annual	July 25
New York Hill M Co	California	J B Leighton	527 Clay st	Annual	July 29

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	May 15
Bodie Con M Co	California	G W Sessions	309 Montgomery st	50	June 5
Derbec Blue Gravel M Co	California	T Wetzel	322 Montgomery st	10	May 25
Idaho M Co	California			4.00	Apr 2
Jackson M Co	California	D C Bates	309 Montgomery st	10	Mar 16
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 21
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Apr 28
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Mar 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Apr 2

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING June 26.		WEEK ENDING July 3.		WEEK ENDING July 10.		WEEK ENDING July 17.	
Alpha	.60	.70	.80	.70	1.75	1.10	1.65	
Alta	1.70	2.20	1.90	2.10	1.90	2.15	2.05	3.45
Andes	.20	.30	.35	.40	.45	.45	.70	
Argenta								
Belcher	.70	.80	.70	.75	.85	.95	1.50	
Belding								
Best & Belcher	1.15	1.70	1.50	2.10	2.10	2.70	2.15	3.50
Bullion	.20	.45	.35	.40	.40	.50	.65	1.20
Bonanza King								
Belle Isle	.60	.80	.60	.70	.65	.75	.35	.65
Bodie Con	3.95	4.45	3.20	3.65	2.15	3.50	1.35	2.10
Benton	.50	.60	.50	.55	.45	.55	.45	.75
Bodie Tunnel				.20		.15		
Bulwer	.60	.65		.50	.50	.55	.35	.50
California	.05	.25	.20	.25	.25	.30	.20	.45
Challenge						.20		.25
Champion								
Chollar	1.50	1.65	1.00	2.15	2.05	3.10	3.15	4.75
Confidence							1.00	1.75
Con. Imperial						.10		.10
Con. Virginia	.10	.20	.15	.30	.25	.35	.30	.50
Con. Pacific		.30	.40	.50		.40	.40	.45
Crown Point	1.10	1.25		1 15	1.20	1.40	1.10	2.00
Day		1.25						
Eureka Con	2.00	2.10				2.50	2.00	2.50
Eureka Tunnel								
Exchequer	.20	.25		.25		.30	.35	.50
Grand Prize	.30	.35				.35	.35	.40
Gould & Curry	.50	.70	.55	1.00	.85	1.80	1.65	2.55
Goodhue						.15		
Hale & Norcross	2.45	2.80	2.65	2.90	2.80	4.55	4.20	6[illegible]
Holmes								
Independence	.35	.40					.25	.55
Julia								
Justice		.25						
Martin White						.65	.35	.40
Mono	.75	1.10	.45	.60	.30	1.05	1.00	2.65
Mexican	.55	1.05	.80	.90	.75	1.10	1.00	2.65
Mt. Diablo						2.00		2.00
Northern Belle								
Navajo	3.40	4.30	3.80	3.90	4.05	4.25	3.75	4.10
North Belle		.20		.20				
Occidental		.25		.90	1.25	1.50	1.35	1.70
Ophir	.70	.95	.80	.85	.85	1.10	1.10	2.25
Overman				.15	.20	.30	.25	.40
Potosi	.40	.45	.40	.80	.80	1.80	1.50	2.30
Pinal Con								
Savage	.70	.75	.70	.80	.80	1.15	1.15	1.70
Seg. Belcher				1.25		1.50		
Sierra Nevada	1.00	1.10	1.00	1.10	1.05	1.50	1.50	2.50
Silver Hill						.10		.10
Silver King				5.25		5.00		
Scorpion				.10		.15	.20	.40
Syndicate	.50	.60		.50	.45	.50	.45	.50
Tioga								
Union Con	.60	.80	.65	.75	.70	.95	.95	2.40
Uta h		.40		.30	.35	.60	.60	1.85
Yellow Jacket	1.75	1.80		1.85	1.90	2.65	2.35	2.75

Sales at San Francisco Stock Exchange

THURSDAY A. M., July 17.

755	Alta	2.90@2.95	90	Alpha	1.35@1.45
200	Alpha	1.00@1.10	100	Belle Isle	.55c
250	Andes	.40c	220	Belcher	1.10
670	Bodie Con	1.30	450	Belmont	.45c
100	Benton	.65c	570	Bodie	1.65@1.75
450	B. & Belcher	2.15@2.20	1050	B. & Belcher	2.25@2.35
350	Belle Isle	.60c	350	Benton Con	65c
100	Belcher	1.10	430	Bullion	.65c
80	Bulwer	.25@.35c	690	Con. Virginia	.35c
150	Bullion	.70c	120	Crown Point	1.40@1.45
200	Belmont	1.05	200	Con. Pacific	.45c
1100	Con. Virginia	.30c	100	Champion	10c
1110	Chollar	3.70@3.75	80	Challenge	.25c
600	California	.30c	4010	Chollar	3.75@4.00
200	Crown Point	1.30	150	Confidence	1.50
200	Con. Pacific	.45c	270	Exchequer	.35c
100	Caledonia	.10c	550	Grand Prize	.30@.35c
100	Exchequer	.30c	900	Gould & Curry	1.80
600	Gould & Curry	1.75@1.80	1950	Hale & Nor	4.85@5.25
1485	Hale & Nor	4.75@4.80	250	Justice	.35c
1100	Justice	.30c	760	Mexican	1.95@2
800	Mono	.35c	100	N. Belle Is	.20c
1150	Mexican	2.00@2.10	1030	Ophir	1.55@1.65
470	Ophir	1.55@1.60	3675	Potosi	2@2.15
30	Overman	.20c	370	Sierra Nevada	1.60@1.70
650	Potosi	1.80@1.85	4180	Savage	1.30@1.50
1000	Savage	1.40@1.45	100	Silver King	4.75
285	Sierra Nevada	1.75	200	Syndicate	.35c
50	Scorpion	.20c	500	Silver Hill	10c
150	Union	1.70	550	Scorpion	20c
50	Utah	1.10	180	Utah	1.00@1.05
500	Yellow Jacket	2.00	460	Union	1.70
	AFTERNOON SESSION.		100	Yellow Jacket	2.25
450	Andes	.45c			

TEN out of twelve jurymen found that the death of the twenty-three men at the Wellington Colliery, B. C., was caused by the culpable negligence of the foreman, John Knox, who has been arrested.

Mining Share Market.

Although, in the early part of the week, there was a brisk market in stocks, it has not continued, and prices have fallen off; still the market has been livelier than for some time past. During the 4th, 5th and 6th of July, the Chollar folks stopped work on their bulkhead, and allowed the Hale and Norcross folks to take and use the air when they went into the 2800 level and worked for three days. The developments made were such as give a better opinion of the ore formation at that point than anything that has yet been done there, and are encouraging for the future of the middle mines.

At the north end progress in sinking the Mexican winze is slow. The rock is a sort of a bastard quartz that breaks so short that blasts have very little effect.

On the 2900 level of the California and Consolidated Virginia work in the south drift has been suspended, owing to the appearance of water in the face, and the diamond drill is being sent ahead.

At the Best and Belcher, a west drift is being pushed forward jointly with the Consolidated Virginia, from which an upraise will eventually be made to connect with the drift that will be run out west from the 825 level of the Bonner shaft. This will form the beginning of very extensive explorations in the old upper levels of the Best and Belcher and Gould and Curry mines.

At Gold Hill all is going on about as usual in the leading mines. Sufficient ore is being extracted to keep all the mills on the Carson river in full blast.

Meetings and Elections.

JOHN HENRY G. and S. M. Co., Calaveras Co., July 8. W. C. Felch, L. A. Vogel, John Riley, J. H. Coyle, Milo J. Ayer, F. A. Morgan and Judge Jas. Galloway. At the subsequent meeting of the new Board of Directors, W. C. Felch was chosen President; John Riley, Vice-President; J. H. Coyle, Secretary; and M. J. Aver, Treasurer. It is the intention of the Board to commence operations at the mine immediately.

UTAH S. M. Co., July 10. Directors—Chas. H. Fish, President; R. H. Follis, Vice-President, and A. B. Hull; G. C. Pratt, Secretary; D. B. Lyman, Supt.

OVERMAN S. M. Co., July 12. Directors—W. W. Stetson, M. Schmitt, S. Heydenfeldt, Jos. Clark and R. Wegener.

BEST AND BELCHER M. Co., July 14. Directors—George Congdon (subsequently elected President); R. H. Follis, Vice-President; Robert Sherwood, Charles H. Fish, S. Heydenfeldt. The Nevada Bank, Treasurer; William Willis, Secretary; and H. Penoyer, Superintendent.

SAN FRANCISCO and North Pacific Railroad Co., July 14. President, Peter Donahue; Vice-President, J. M. Donahue; Treasurer, Thomas I. Bergin; Secretary, Thomas W. Johnston.

SAN FRANCISCO and San Rafael Railroad Co., July 14. President, Peter Donahue; Vice-President, J. M. Donahue; Treasurer, Thomas I. Bergin; and Secretary, Thomas W. Johnston.

SONOMA Valley Railroad Co., July 14. President, Peter Donahue; Vice-President, J. M. Donahue; Treasurer, R. H. Lloyd; and Secretary, Thomas W. Johnston.

Personal.

Mr. and Mrs. W. B. Ewer gave a wedding reeeption to their son, Mr. William C Luce and wife, nee Lillian Lloyd, at the residence of Mr. Ewer, 1516 Folsom street, last Thursday evening. The house was decorated with evergreens, smilax and flowers, while the lawn was brilliantly lighted with Chinese lanterns. The spacious parlors were canvassed, and music, daneing and singing enlivened the oceasion until tbe early morning hours. Several songs were beautifully sung by Miss Ella Lark, and an instrumental pieee brilliantly rendered by Miss Jennie Ward, who also favored the compauy with a song. A fine variety of useful and ornamental presents were made. A large party of friends congratulated the happy young couple, and we take this opportunity to extend our congratulations to them and hope that health and prosperity will lie in their path. Among the guests present at the reception were: Mr. and Mrs. A. T. Dewey, Mrs. Annie J. Lambert and daughter, Captain George Morehouse, Miss Eva d'Ancona, Miss Mamie Anthony, Mr. Anthony, Mr. d'Aneona, Mrs. R. C. Luce, Mrs. Frank Dagget and son, Rev. N. L. Rowell and wife, Miss Bartlett of New Bedford, Mr. Edwin Foster, Mr. and Mrs. J. J. Evans, Miss Eliza B. Ewer, Mr. and Mrs. H. K. Cummings and daughter, Miss Jennie Ward, Mr. Arthur Luce, Mr. Jireh Luce of Healdsburg, Miss Annie Volmer, Miss Laura Volmer, Mr. Volmer, Captain and Mrs. Freeman, Miss Chamberlain, Captain and Mrs. Gray, Dr. Cook and wife, Miss Cook, Miss E. Lark, Miss Allie Lloyd, Mr. Frank Crawford, Mr. George H. Bradshaw and wife, Mr. McCue, Mr. William Chisholm, Mr. Carl Chisholm, Mrs. Lark, Misses Laflin, Mr. and Mrs. Evans, Mr. and Mrs. Hoffman, Miss Noyes, Mr. Ed. Foster, Mr. Campton and lady, Mr. H. Muire, Miss Mary Daniels and sister.

New Incorporation.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department 10, San Francisco:

AMERICAN POWDER CO., July 15. Object to buy and sell patent rights of all kinds. Capital stock, $1,000,000. Directors—George H. Harpers, John A. Carroll, L. H. Pockman, A. Rodgers and T. J. O'Keefe.

Cheap Ore Pulverizer.

There is for sale in this city, by L. A. Heald, American Machine and Model Works, 111 and 113 First street, a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below costs, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. References as to above can be had upon applying to this office.

ASSESSMENT NOTICE.

Gould & Curry Silver Mining Company.

ASSESSMENT No. 48.

Levied.....June 18[illegible]
Delinquent.....July 11, 1884.
Day of sale.....August 4, 1884.
Amount.....Fifty cents per share.

ALFRED K. DURBROW, Secretary.

OFFICE—Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

QUICKSILVER.

THE CELEBRATED **A** BRAND.

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A. SCHURCH, Mathematical Instrument and Model Maker, 335 Bush street, S. F. Scientific Apparatus and Experimental Machinery at short notice.

J. MACDONOUGH. J. C. WILSON.

J. MACDONOUGH & CO.,

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COAL and PIG IRON,

41 Market Street, cor. Spear, San Francisco, Cal.

PIG IRON, ENGLISH FOUNDRY COKE, CUMBERLAND & LEHIGH COAL

SPECIALTIES.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.]

FOR WEEK ENDING JULY 8, 1884.

301,557.—AMALGAMATOR—A. C. Bowen, Michigan Bluff, Cal.

301,561.—PRISMATIC TOY—S. S. Butler, Los Gatos, Cal.

301,562.—PRISMATIC TOY—S. S. Butler, Los Gatos, Cal.

301,605.—METALLIC PACKING—Thos. Johns, The Dalles, Or.

301,611.—CHANGE GATE FOR CARS—F. O. Landgrane, S. F.

301,619. AMALGAMATOR—P. McElligott, Bear Valley, Cal.

301,746.—PADDLE WHEEL—A. S. Morrison, Portland, Or.

301,828.—SAW MILL SET WORKS—A. A. Osborn, S. F.

301,629.—GRAPE CRUSHER, ETC.—P. Sainsevain, San Jose, Cal.

301,757.—SCARF RETAINER—J. Sandilands, S. F.

301,705.—HOOP IRON—A. J. Spicer, Portland, Or.

301,052.—WHIFFLETREE AND TRACE HOLDER—G. G. Wickson, S. F.

301,053.—FISHING MACHINE—T. F. Williams, Cascade, Or.

NOTE. Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

PRISMATIC TOYS.—Samuel S. Butler, Los Gatos, Santa Clara County, Nos. 301,561 and 301,562. Dated July 8, 1884. This invention relates to a new toy in which a prism is adapted to refract the rays of light and throw them in widely distributed and varying prismatic colors. The invention consists in a prism having formed near each end suitable wheels or rolling surfaces, and properly mounted or journaled in a frame or handle, whereby it may be rolled along over an opaque surface or over a peculiarly arranged mirror or reflecting surface. The object is to provide a toy which shall combine instruction with amusement. In the second patent the inventor has a series of prisms mounted in a frame and arranged to be rotated on a common axis, said prisms to be used either with or without a reflecting surface or mirror over which they rotate. The toy is designed to be placed on a window sill, the mirror lying thereon. The room may be darkened and but little light admitted, except those rays which are caught by the prisms and the mirror. The prisms throw the colors over the walls, and the mirror increases their number materially. By rotating the prism frame the colors are made to travel rapidly, dancing about, varying in form and portion, crossing each others path and producing a curious and beautiful effect. The change of each prism on its axis provides for further adjustments, and any one may be set at the best angle to produce the best result.

CHANGE-GATE FOR CARS.—Frank O. Landgrane, S. F., No. 301,611. Dated July 8, 1884. A "change-gate" is designed to be applied to all doors of street cars and similar places where it is necessary to have an opening through which money may be passed and change made, and at which point it may be necessary to attract the attention of the driver or person who is to make the change. It consists of a gong secured between plates which are fitted from the opposite sides of the door, a hammer by which the gong is struck, a bell crank lever with a tripping attachment by which the hammer is operated; a gate hinge to the top of the plate to which the gong is fixed, having a double cam projecting upon each side at its lower edge and engaging the transverse head of a vertical moving rod or piston, the lower end of which engages and actuates the bell crank lever. In this invention, Mr. Landgrane has simplified the mechanism by which the operation is performed, and reduced the number of moving parts, besides making the apparatus dust-proof and more compact.

WHIFFLETREE AND TRACE HOLDER.—George G. Wickson, S. F., No. 301,652. Dated July 8, 1884. This improved draft bar or whiffletree and trace holder consists of two parallel wooden bars firmly secured a certain distance apart and at the same time held in that position by a draft link, clamping-plates and nuts. The ends are held in place by peculiarly-shaped swivel-hooks which also serve for the attachment of the traces and to hold them in such a position as to protect trees or vines from injury as they pass. The invention also covers a means for protecting the draft link or staple from wear and to act as a shoulder or stop when the nuts are turned up tight, without the necessity for forming shoulders upon the staple, By means of this whiffletree a flat leather surface is presented to the bark of the tree or vine and the danger of injury by careless plowmen or cultivators is obviated.

AMALGAMATOR. August C. Bowen, Michigan Bluff, Placer Co., Cal. In January, 1883, Mr. Bowen patented a peculiar amalgamator which we described at the time as consisting of a pan of considerable diameter, having its rim and center raised, so that there will be an annular channel with a curved bottom around the periphery, within which heavy balls are caused to travel by a rolling motion of the pan about its center of support. Mr. Bowen now patents, in combination with this, a mechanism for adjusting the angle of inclination of the axis of the pan, removable dies for the interior of the pan and certain other details of construction which perfect the amalgamator and render it more readily adjustable.

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, July 17, 1884.

ANTIMONY—Per pound		14 @	15
BORAX—Per Pound (extra)		16 @	—
IRON—Glengarnockton	25 00 @	—	
Eglinton, ton	24 00 @	—	
American Soft, ton	47 50 @	—	
Oregon Pig, ton	@	—	
Clipper Cap, Nos. 1 to 4	30 00 @	32 00	
Clay Lane White	23 00 @	—	
Shotts, No. 1	26 00 @	—	
Refined Bar	3½@	3	
Boiler, 1 to 4	5 00 @	5 50	
Plate, 5 to 10	4½@	4¾	
Nail Rod	7¼@	—	
Norway, according to thickness	6¼@	7¼	
STEEL—English Cast, lb	14 @	15	
Black Diamond, ordinary sizes	14 @	15	
Drill	15 @	—	
Machinery	12 @	14	
COPPER—Ingot	22 @	—	
Brazers' sizes	32 @	—	
Fire-box sheets	28 @	—	
Bolt	25 @	28	
Old	12½@	15	
Bar	@	—	
Cement, 100 fine	12 @	—	
LEAD—Pig	4½@	—	
Bar	5½@	6	
Pipe	7 @	—	
Sheet	8 @	—	
Shot, discount 10% on 500 bags: Drop, ₱ bag	2 00 @	—	
Buck, ₱ bag	2 20 @	—	
Chilled, do	2 40 @	—	
TIN PLATES—Charcoal	6 00 @	6 50	
Coke	6 00 @	—	
Banca tin	22 @	23	
I. C. Charcoal Roofing, 14x20	6 25 @	6 50	
ZINC—By the cask	19 @	—	
Sheet, 7x3 ft, 7 to 10 lb, less the cask	9 @	10	
NAILS—Assorted sizes	3 25 @	—	
QUICKSILVER—By the flask	29 00 @	—	
Flasks, new	1 05 @	—	
Flasks, old	85 @	—	

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

MR. S. A. EARLE, a brother of L. M. Earle, of Lancha Plana, was caved on while working in a mine near that place last week and killed.

SHIP RIGGING.

TELEGRAPH WIRE

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FOR THE BEST IRON AND STEEL WIRE ROPE

SEND TO THE John A Roebling's Sons Co TRENTON, N.J.

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JARED C. HOAG—California.
J. J. BARTELL—Sacramento county.
A. S. DENNIS—San Mateo county.
C. D. MCDUFFIE—Sacramento county.
B. W. CROWELL—Fresno and Tulare counties
A. C. KNOX—Sonoma and Marin counties.
JOHN H. STURCKE—Santa Clara and San Benito counties.
GEO. MCDOWELL—Nevada and Placer counties.
WM PASCOE.

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Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

NINETEENTH
Industrial Exhibition
..... AND .....
MECHANICS' FAIR
SAN FRANCISCO, 1884.

Opens August 5th; closes September 6th.

MECHANICAL PROGRESS, INVENTION, ART AND NATURAL PRODUCTS will be represented by the best obtainable exhibits on this coast. An

INSTRUMENTAL CONCERT

By an efficient Orchestra each afternoon and evening

PREMIUMS.

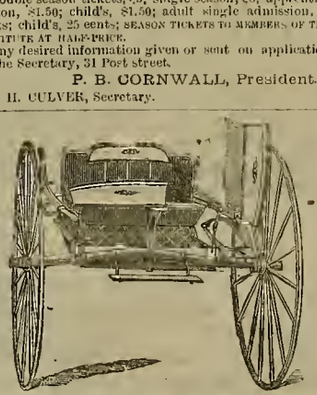
Medals of Gold, Silver and Bronze, Diplomas and Cash will be awarded as premiums to meritorious exhibits.

ADMISSION.

Double season tickets, $5; single season, $3; apprentice season, $1.50; child's, $1.50; adult single admission, 50 cents; child's, 25 cents; SEASON TICKETS TO MEMBERS OF THE INSTITUTE AT HALF-PRICE.

Any desired information given or sent on application to the Secretary, 31 Post street.

P. B. CORNWALL, President.
J. H. CULVER, Secretary.



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The Spring Shaft does away with the disagreeable motion of the horse, and the open seat affords easy and safe access from the rear. It costs less to ship, is light, Neat Stylish and easy riding.

Three men with Adel's Grain Elevator pile up in warehouse, or field, 1,500 sacks in a day. Address:

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The Next Term will open July 31, 1884
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The next year will begin on Wednesday, July 30, 1884.
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PLATINUM FOR ALL
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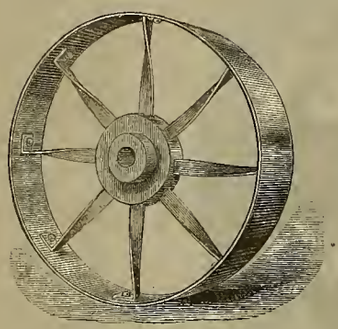
Iron and Machine Works.

MACBETH'S
—PATENT—
STEEL PULLEY.



Advantages of these Pulleys.

They are less than half the weight of cast-iron pulleys; are polished on the face; are made either crowned or straight, and are turned in the lathe the same as the best make of cast-iron pulleys.

They are carefully balanced. They are subject to no contraction strains, and can be run at very high speed without danger of bursting.

On account of their great lightness and the form of the arms, they absorb less power than any other pulley.

They are *the only pulley of the kind* which runs true. They cannot be broken in transport.

TESTIMONIAL:

MATHER LANE SPINNING CO. (Limited), LEIGH, ENGLAND, Nov. 5, 1883.

N. Macbeth, Esq.—Dear Sir: The Patent Steel Pulleys supplied throughout to our No. 2 Mill are working to our entire satisfaction.

They are very true, and are about 50 per cent lighter than the cast-iron pulleys in our No. 1 mill.

Yours faithfully,
For the Mather Lane Spinning Co. (Limited),
[Signed:] RICHARD T. MARSH,
Managing Director.

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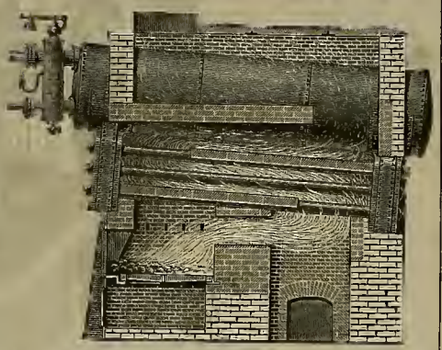
Economy in space and fuel. Safety at high pressures. Freedom from scaling. Equally adapted for power and heating purposes. Especially adapted for mills, factories, hotels, stores or any place where safety is a necessity. Will work well with muddy water and any kind of fuel.



TESTIMONIALS.

ST. LOUIS, Mo., Sept. 28, 1883

Messrs. Adolphus Meier & Co.—GENTLEMEN: We cheerfully certify that the "*Heine Patent Safety Boiler*" put up by you in our establishment has proved very satisfactory in its working. The chief points of excellence in the "Heine Safety Boiler" are its economy in fuel and space, freedom from scaling, aptitude for power and heating purposes, working equally well with clear and muddy water. We warmly recommend it to all using steam machinery. Yours truly,

ANHEUSER-BUSCH BREWING ASS'N.

OFFICE OF SUPT OF ROYAL RAILWAYS, BERLIN, Sept. 23, 1883.

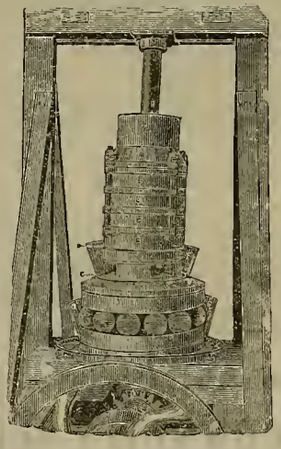
To Mr. H. Heine, Civil Engineer: In reply to your inquiry of September 2d, we respectfully inform you that the three boilers built under your patents, under steam since September 25, 1881, at the Alexander Place Depot, as well as the two at Friedrich Strasse Depot, under steam since September 22, 1882, have given good satisfaction, requiring no repairs whatsoever to date. The internal cleaning of the boiler was always accomplished with ease on account of the convenient arrangement of the tube caps, the adhesion of scales being fully prevented thereby, and the boilers kept in prime condition.

(Signed): BRAUCKE.

Send for Circular and Prices.

F. P. BACON, PRESIDENT C. L. FOUTS, SECRETARY

THE GLOBE IRON WORKS COMPANY



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PRICE OF PLANT REDUCED ONE-THIRD.
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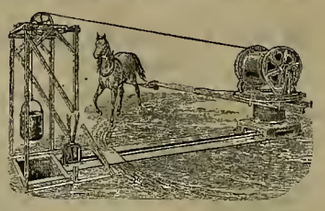

THE MOST EFFICIENT AND PRACTICAL MACHINE ever invented for the service of Prospectors and others requiring the use of a Horse Power; possessing all the requirements of a first-class hoist and affording means for the continuous operation of a Pump or Blower without interfering with a hoisting apparatus.

It is made entirely of Iron; no piece weighs over 250 pounds. At the ordinary speed of a horse a 1,000-pound bucket of ore may be raised 120 feet per minute. The hoisting drum is under the complete control of the man at the shaft, and is capable of carrying 500 feet of five-eighths steel rope. The cost of erection is slight, as two men in half a day can easily put it in place ready for work.

While this power is more particularly for mining purposes, it is equally adapted to all other uses where animal power is required. ☞SEND FOR CIRCULAR. Address

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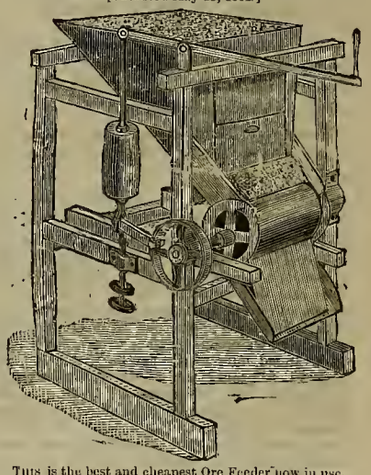
THE ROLLER ORE FEEDER

[Patented May 28, 1882.]



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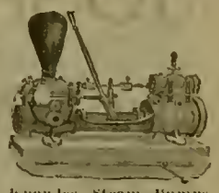
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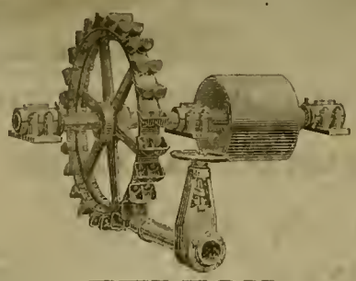

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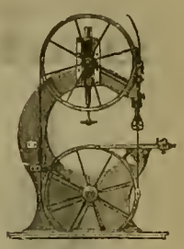

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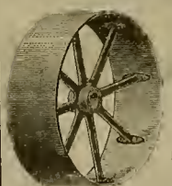
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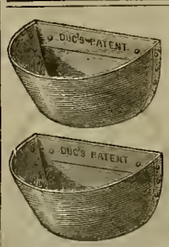

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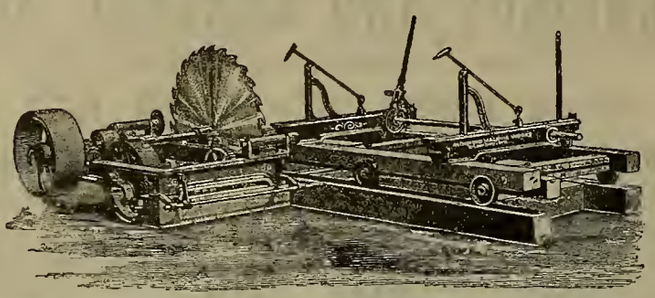

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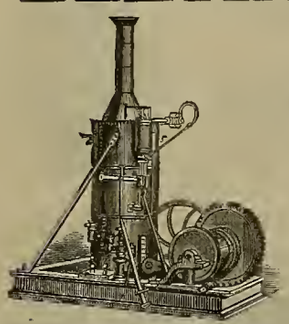

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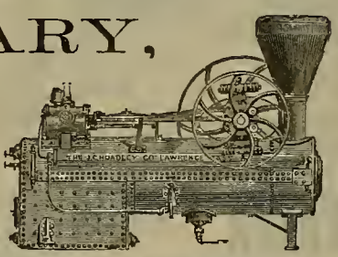

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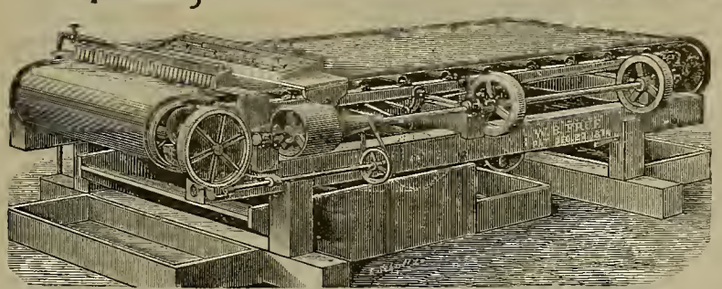

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A machine can be seen in working order and ready to make tests at the office of Hinckley, Spiers & Hayes, No. 220 Fremont Street, San Francisco.

To those Intending to Manufacture or Purchase the So-called "Triumph" Concentrator, we Herewith State:

That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

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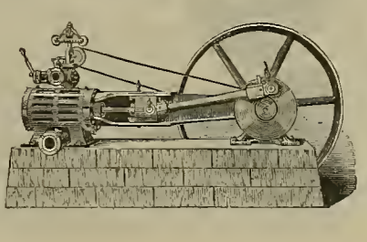

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JULY 26, 1884.

VOLUME XLIX Number 4.

The Cummer Automatic Engine.

The Cummer Engine Company's Works, Cleveland, Ohio, has become one of the largest and best equipped institutions in the whole country.

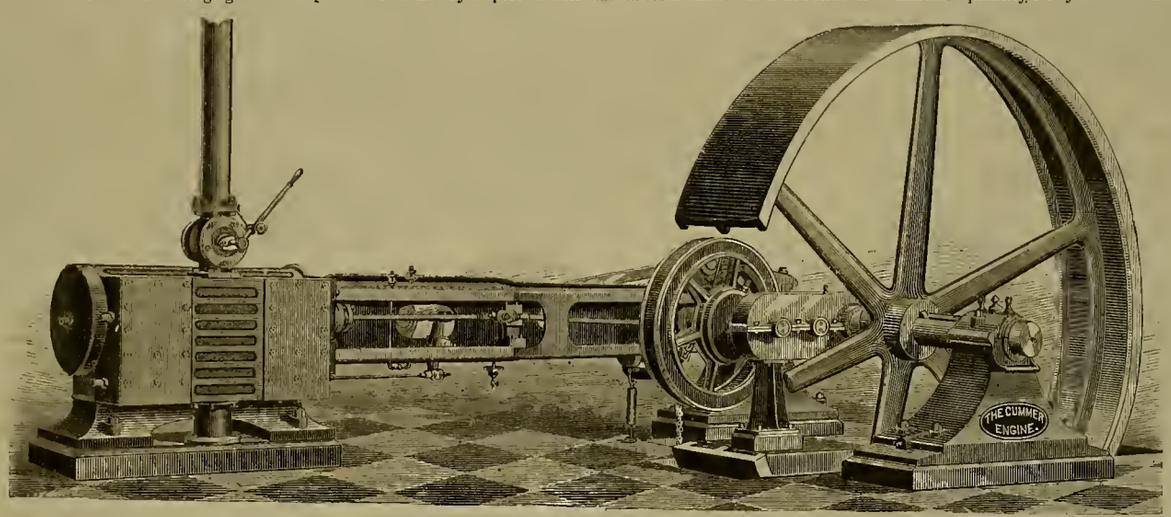
It has been but about one year since their large plant at Cleveland turned out the first engine. The shops were then thought to be equal to all demands that might be made on them, but it is no doubt a source of great pleasure to that company to be compelled to enlarge their works so soon, and to add the number of very heavy and fine tools which are now being built to their order. They have lately placed an order for three weighty lathes that will swing 5 ft. and for a large horizontal turning and boring mill, with a capacity to turn a pulley 20 ft. in diameter by 5 ft. face. This mill is to have a special feature in the shape of a slotting or key-seating device that will keyseat the pulley perfectly as soon as turned and bored, without ever moving from its center.

They are also putting in a very large steam hammer which will soon be in operation, and are again adding large and very durable buildings.

The Cummer Engine (one of the "class C" which is shown in the engraving on this page) has received the most careful attention from its makers, and every detail is as closely and critically constructed as good work can be. The templets and standa d gauges for every part of the engine are very complete and accurate. In the different departments, each part or piece of the engine is made to its templet, and when the pieces are assembled on the erecting floor, they accurately fit the places intended for them.

The Cummer Company report orders steadily on the increase, and say that the outlook for 1884 is very flattering. They claim to have the best automatic engine ever built. It is clear of trappy devices, as the cut plainly shows. The governor of this engine is a marvel of ingenuity, simplicity and durability. The remarkable promptness with which the governor acts and meets variable loads thrown on or off the engine is a source of great interest to even the best engineers.

From the fact that many large and influential manufacturing companies have been and are placing their orders for Cummer engines, the popularity of the engine is evidenced. The Pennsylvania Railroad Company have just placed their order for one of these engines, 130 horse-power, for their large shops now being built in Indianapolis, Ind. Before deciding, their experts made two separate tours of inspection, visiting the prominent engine shops and examining the different engines in operation and in course of construction. The fact that the acknowledged skill of the experts of this important company, in matters of steam and steam economy, has selected the Cummer engine is no doubt received by its makers with a great deal of satisfaction and pleasure.



THE CUMMER ENGINE.

Gravel Strike.

A correspondent in Downieville informs us that on the 19th inst. the Bald Mountain Extension Co. broke through the lava flow about 1,100 feet in width, the distance run by their main tunnel, now in quartz bowlders and gravel. Superintendent Lawry reports it fair for good pay. The people of Forest City are much rejoiced over the glorious discovery, and well they may be for it insures for them a prosperous future. It is supposed there must be ahead an uninterrupted rich gravel lead for miles up the ridge. At last the Extension Co. have the channel "cornered." If the lead continues straight ahead, in 500 feet it will cross the line into the Extension. Should the lead bend north, then it has about 200 feet to run to the Extension. The main tunnel is now underground over a mile, though turning at right angles. This is one of the most important discoveries made in this State for years, in its far-reaching results and possibilities for the future. Underneath the lava flow is believed to be a rich gravel lead that will be developed in time. The owners all feel much encouraged for the future.

L. L. Robinson, President of the State Miners' Association, says that the Association did not ask for an appropriation to appeal the Woodruff case to the U. S. Superior Court, from Nevada county, has not availed itself of the appropriation, nor is it certain that it will do so. Neither is it certain that the North Bloomfield Company will appeal as it is now drifting and will soon fit up its mine to hydraulic in such a manner, by filling up its old pit, as not to infringe the injunction.

The Del Monte mill is working ore from the Silver Lining mine, Aurora. The mill is now under the superintendence of Samuel McCurdy, who was long identified with the Standard-Bulwer mill, Bodie.

Land Officers Locating Mining Ground.

A Receiver of the Land Office in Oregon, as far back as 1873, took up a placer claim which in the following year he sold to certain parties who afterwards applied for a patent on it. The Commissioner of the General Land Office rejected the entry on the ground that its location by the local Land Officer was in violation of the regulations of the office.

It seems a circular of the Land Office, issued in 1876, prohibits Registers and Receivers from making entries of public lands on penalty of removal from office. It is doubtful if a mineral entry comes within the rule. But the Secretary of the Interior reverses the decision of the Commissioners because it would be an injustice to the entrymen. They purchased of the Receiver in good faith, for a valuable consideration, and in ignorance of the rule, and spent $500 on the claim. There was no evidence of improper conduct on their part. Moreover, the Receiver who was still retained in office, states that he made the location and sale in good faith, not supposing either to be in violation of any rule. Even if he knowingly disobeyed it, the Secretary is not of the opinion that the fact should effect the rights of grantees against whom nothing appears.

Austrian Quicksilver Works.—Mr. J. B. Randol, of the New Almaden mine, has had translated by Mr. S. B. Christy, instructor of mining and metallurgy at the University of California, a work on the Imperial Quicksilver Works at Idria, Krain. It was originally issued by the Mining Directory at Idria, in celebration of the 300th anniversary of the exclusive management of the mines by the Austrian Government. Mr. Randol has published the translation in a handsome manner. Next to the mine at Almaden, Spain, these mines have produced the greater part of the quicksilver used by the entire world for four centuries; and outside of the Almaden, in Spain, and New Almaden in California, it has still the largest annual product of quicksilver. The brochure contains a history of the mines, a description of the ore deposits, of the mining and ore dressing, the reduction and vermilion works, a chapter on production and profit, administration, etc.

Working for Themselves.

It is stated that in some parts of this State where the larger hydraulic mines have shut down owing to the decrees of the courts, the men, having no longer an opportunity to work for the companies, have been compelled to look out for themselves, and are really doing better than when working by the day. As the companies cannot use the water they allow it to flow to waste in its natural channels, and as a consequence many of the small streams are flowing that have not had any water in them in any quantity for years. Men could not work the ground near them for lack of water. Now, however, they have taken up, leased, or rented small pieces of land and are making better than wages. Where they used to work for $2.50 per day they can sometimes make from $4 to $5 per day when working for themselves. Of course it is not everywhere that this is possible, but it is the case in a number of places in the interior of this State. There is no reason that this should not be so. There are many places all over our mining regions where gold bearing ground remains alongside of the mountain streams, and the only reason why many of them have not been utilized is that the large companies have controlled the water. Now that they cannot use the water themselves and allow it to run to waste, there is no objection to others using it.

A very great advantage of miners working for themselves when they can do so is that the gold taken from the claims is kept or spent in the neighborhood where it is taken out. When the companies take out the gold, aside from what is paid out for wages and supplies, the yield all goes to the stockholders, who are frequently non-residents.

The money is not, therefore, of very much use to the region where it is produced, but with several hundred men who live in the mining region, all working for themselves, the money taken out is kept at home.

In several places river mining is now being carried on as it used to be years ago and before the big companies took steps to get all the water rights they could for their mines. A large hydraulic mine takes a great deal of water, and collects it from all available sources in the vicinity. Now, however, that many of these big mines have shut down, there is more water available for individuals who want to mine for themselves.

The project of erecting sampling works in Butte, Montana, has been abandoned. They will be erected at Dillon. Matthews & Webb think that smelting men of Butte would combine against them.

The Miners' Fund of New Almaden.

The following was read before the American Institute of mining engineers at Chicago Meeting, May, 1884, by Samuel B. Christy, of California:

At the last meeting of the Institute, several contributions were made to the subject of miners' aid funds. Such matters will always form important factors in the administration of large industrial enterprises. From the frequently remote and isolated position of mining properties, it is a subject that often forces itself upon the attention of the mining engineer. Local conditions are usually so variable that no single method can be found equally well adapted to all localities. At the same time, a study of different types is often suggestive and valuable, and it is with this in view that these notes are presented.

The Miners' Fund of New Almaden is a remarkably successful example of what may be done for miners by a wise and at the same time firm management, by simply directing their own efforts and without incurring any great expense to the stockholders,—a practical consideration not without importance in most cases.

The quicksilver mines of New Almaden are situated at a distance of fifteen miles by wagon-road from San Jose, the nearest town from which medical and surgical aid can be summoned. The great delay in case of accident and the expense in cases of long illness naturally gave rise to much difficulty in the early history of the mine. Physicians would charge a fee of twenty-five dollars for each visit; so that as a matter of mere economy, it was cheaper to die than to fall ill.

In order better to understand the conditions of the problem, a word as to the

Number and Nature of the Population

Will be necessary. The total number of men on the Company's pay roll at the mine and hacienda (reduction works) varies from 400 to 700 men. The total population is estimated to vary from 1,400 to 1,600. The last school-census showed:

316 children between 5 and 17 years at the mine.

105 children between 5 and 17 years at the hacienda.

The total number of minors was estimated at 600. By far the larger part of this population resides at the mine in the so-called "English Camp" and "Spanish Town," the rest live at the hacienda, all on the company's property. This population is largely Spanish-American. Nearly seventy-five per cent are of this origin. Most of these are Mexicans; a few are South and Central Americans. About twenty per cent. are Cornish miners and their families; the other five per cent. are Germans, Swedes, and other foreigners, with a few Americans. Two unsuccessful attempts were made to furnish

Efficient Medical and Surgical Aid

To the mine. The first attempt was made by the management as early as the fall of 1864, to secure the services of a competent physician. Each male adult at the mine was required to pay one dollar per month, in consideration of which he and his family were furnished with medical attendance and medicine. The whole sum collected was paid over to the physician, who gave his own time and furnished the medical supplies. Of course this innovation led to much opposition, complaints being made against the compulsory nature of the contributions; so that the scheme was abandoned after a trial of three months.

From that time till the Spring of 1870, the people were left to the tender mercies of local quacks, or were compelled to send San Jose as before. At the period named the need of a change was so strongly felt by the miners themselves, that a system of voluntary subscriptions was started among them. The plan this time was to pay over the whole sum to two competent physicians of San Jose, who agreed to visit the mine every other day, alternating with each other; they also agreed to furnish all necessary medicines and to come on odd days without extra charge in cases of emergency. This plan worked well at first; but dissatisfaction arose from the fact that many of the miners who were non-contributors still received nearly as much benefit as those who paid. By degrees, therefore, the number of contributors decreased until the fund became insufficient to pay the physicians; and so the second plan, that of voluntary subscriptions, failed.

The result of this experiment did much to convince the miners that compulsory contributions were necessary to make such a scheme a success: so that in the latter part of 1870, soon after the direction of the mine was assumed by the present manager, Mr. J. B. Randol, the miners were ready to petition that he assume control of the Fund, and that contributions be made compulsory. After convincing himself that this was the wish of a large majority of the employees and residents, Mr. Randol established what is known as the Miner's Fund, and assumed entire control as trustee. He has occupied this position for over thirteen years, without salary; and to his skillful management is due the high state of practical usefulness which the fund has reached, in spite of previous failures.

At the time he began the apparent future of the mine did not justify an additional expense on the part of the company; while on the other hand, it was equally evident that the fund should be in such a position that it could offer sufficient permanent inducement to a competent physician for him to abandon his regular practice and become a resident at the mine.

With these things in mind, the organization was effected, the rules and regulations of which have since been modified from time to time, as experience under the peculiar conditions suggested.

The rules and regulations now in force may be gathered from the following notice posted at the mine:

"Miners' Fund."

This Fund, instituted for the benefit of the residents of New Almaden, is established upon the following basis:

I.

Employees of the Quicksilver Mining Company, heads of families and all other adults residing at New Almaden, each pay monthly into said Fund, one dollar. The money so contributed is held by J. B. Randol, Trustee, to be paid out for the following purposes:

1. The salaries of a resident physician, and of a druggist, and for the purchase of medical supplies.

2. For relief of contributors whom circumstances may entitle to the same and for other contingent expenses.

II.

Contributors are entitled without further payment, to the attendance of the resident physician for themselves and their immediate families (except that cases of confinement will be charged five dollars), and will be furnished with medicines prescribed by him on payment of cost.

III.

When the Fund is subject to any expense for relief of persons indigent, or otherwise—say for medicines, nurses or supplies—it will be regarded in the nature of a gift, or as an advance to be repaid as the Trustee may decide to be just, considering the circumstances of each case.

IV.

It is expressly agreed that when the resident physician is called to attend any person not a contributor to the Fund, there shall be a charge of not less than five dollars for each visit, to be paid into the Fund and to be charged against and collected from the head of the house where such non-contributor may be living.

The Trustee serves without pay, and in consideration thereof it is understood that the foregoing rules and regulations will be observed by all persons interested therein; and it is expressly agreed that all sums due, or to become due, to the Fund by the contributors, or any of them, shall be a lien upon any property of the contributors at New Almaden, and upon any money due, or to become due, them for wages from the Quicksilver Mining Company, which money said Company is authorized to pay over to said Fund without further notice.

J. B. RANDOL, Trustee.

New Almaden, February, 1883.

The peculiarities of

The Large Mexican Element

in the population necessitated many of the changes which were made in the rules of the Fund as it was first established. For instance, at first, no charge was made for medicines furnished. But it was soon found that the Mexicans would often draw medicines to double the value of their contributions whether they needed it or not. A friend of mine, recently physician on a Mexican railroad, where the government requires that medical aid shall be furnished by the Company, says that the same difficulty is met with there and has occasioned him much perplexity, as it was frequently impossible to determine whether the men were really ailing or not. At New Almaden the difficulty was met by charging the medicines at cost price, as stated in Rule II.

Another difficulty arose from the fact that, in addition to the numerous blood relatives of a Mexican, he has numerous other connections such as *compadres*, *comadres*, etc. All of these god-fathers, god-mothers and god-children he regards as members of his own family. As a result, when these non-residents fell sick they were often imported for treatment at the hands of the resident physician as members of the family of a contributor to the Fund. This soon gave the physician more than he could do; and the place was turned into a health-resort with free medicine and attendance for the vicinity. This was the case of Rule IV, which, prescribing the fee of five dollars for each visit to a non-resident, at once put a stop to this abuse.

On account of national prejudices it was found necessary to maintain two seperate hospitals, one at "Spanish Town," and the other at the "English Camp." Nurses are paid from the Fund as required.

Whenever an Employee is Injured

While at his work for the company, no charge is made for any medical or surgical supplies furnished him; and if the needs of the case require it, he is furnished with nurses and boarded at the expense of the Fund. When solely dependent on his support his family is provided for during his illness in the same manner. The same is done for ordinary illness in deserving cases of destitution, and the advance is regarded as a gift or a loan, as the trustee may decide to be just.

In cases of fatal accident or the death of indigent persons, the burial expense is sustained by the Fund. It maintains a burial plot at the San Jose cemetery and also one at the hacienda, and another on a sandstone hill near the mine, which latter is not very popular among the miners for obvious reasons, although no one as yet has been discovered there.

The physician is paid a regular salary of $350 a month, and is required to make a monthly report to the trustee of:

The number of visits made each month.
The number of office prescriptions.
The number of vaccinations.
The number of obstetric cases.
The number of salivations.

A professional druggist is employed at the mine to attend to prescriptions; but, as he also acts as clerk for the mine, only the time he is actually engaged as druggist is charged to the Fund, at the rate of $25 per month.

The collections are made and accounts kept by the regular book-keeper of the mine, who receives a salary of $20 per month from the Fund. A complete

Record of the Fatal Accidents

During the last thirteen years has not been kept. During the last four and a half years there have been just nine, or an average of two per year. During this time there have been on an average 440 men employed; this would make an average of less than half of one per cent of fatal accidents per annum. It is a remarkable fact that in none of these fatal cases did the patients live long enough for treatment. In seven cases death occurred instantaneously, and in the other two within half an hour. Three of these accidents happened at the surface and six under ground.

During the last four and a half years the highest annual mortality from all causes was 15 per 1,000 inhabitants; the lowest, 11 per 1,000; the average, 13 per 1,000.

Cases of Salivation

Never occur at the furnaces at present, except through extreme carelessness. The chief trouble of this sort at the hacienda is from cleaning the condensers and working the soot. During 1883 there was no salivation at all at the hacienda. In previous years there has been more or less from the cause stated.

Formerly there was very little salivation in the mines, the cinnabar ores never giving any trouble of that kind. But at present, in working the rich *labores* of the 1600 and 1700 foot levels of the Randol shaft, which contain a great deal of native quicksilver, there has been some trouble from this cause. This ground is in places thoroughly impregnated with native quicksilver, a fragment of ore showing drops all the way from the size of a pea to microscopic globules disseminated through it.

Of course the air in such *labores* is pretty thoroughly saturated with quicksilver-vapor, in spite of all attempts at thorough ventilation. The chief source of absorption seems, however, to have been the skin. As the *labores* are rather warm, the men work by preference stripped to the waist. As a consequence, the dust, and probably the vapor also, is attacked by the saline matter in the perspiration, and introduced into the system through the skin. At least this is the theory of Dr. S. E. Winn, the resident physician; and that this is one important cause is substantiated by the fact that since he has insisted that the men be compelled to wear their shirts in the *labores* while at work the number of cases has diminished. Of course every attention is paid to bathing, and the use of tobacco in any form is forbidden in these *labores*. No deaths have been known to occur from salivation. The treatment follows the iodide of potassium method. Men disabled by salivation get half pay.

A Remarkable Fact

Is the facility with which the Mexicans recover from the wounds resulting from accidents or quarrels, while at the same time they succumb very readily to the attacks of disease. Their chief difficulty is with lung troubles, pneumonia, consumption and the like. This seems partly due to constitutional predisposition, but largely to their careless, reckless life. They will frequently come out of the hot *labores* after a day's work, and without change of clothes expose themselves to the weather or a night of dissipation. The Mexican miners, although occasionally very well developed, do not as a rule last as long as the Cornishmen. The latter being more particular about wearing dry clothes at the surface, and not exposing themselves recklessly, suffer much less from lung troubles.

The average age of the miners is 35 to 40 years, although some of them are 60 to 70 years old. A few boys and no women are employed in the mine.

The following summary of the monthly reports of physicians will give an idea of the amount of work done.

SUMMARY OF MONTHLY REPORTS, 1874 TO 1883, INCLUSIVE—TEN YEARS.

Number of patients visited at their homes	12,156
Number of patients visiting office	41,238
Number of vaccinations	729
Number of salivation cases treated	26
Number of confinements	209
Total cases	84,358

The following is a list of receipts and disbursements for the whole period during which the fund has been in existence:

NEW ALMADEN MINER'S FUND—RECEIPTS AND DISBURSEMENTS FOR THE THIRTEEN YEARS ENDING DECEMBER 31, 1883.

Receipts.

From collections	$80,447 30
From sales of medicine	2,484 00
From obstetric cases	1,280 00
From outside practice	98 00
From donations	24 75
From sale of horse	126 50
From loans repaid	345 00
From interest on deposit in bank	2,551 50
Total receipts	$87,357 05

Disbursements.

Salary of physicians	$47,711 00
Medical stores	13,283 11
Contributions to sick and disabled	4,019 24
Commissions for Collector and Secretary	3,842 34
Hospital nurses	2,748 82
Consultations, fees	1,648 00
Livery	1,425 78
Funeral expenses	865 90
Board of patients	736 65
Furniture	532 84
Surgical instruments	501 42
Office boy, salary	448 75
Incidental expenses	486 97
Loans	345 00
Subscriptions to medical journals and works	312 40
Disinfectants	252 92
Smallpox hospital	52 25
Collections refunded	27 50
Taxes	18 00
Fuel	15 22
Apothecary's salary	275 00
Total disbursements	$79,522 11
Deposits in banks	7,544 32
Cash at mine	290 62
	$87,357 05

The Company furnishes to the Fund at the present time a horse with stabling, and all the necessary buildings for offices, hospitals and dispensary and dwellings for physicians, free of expense.

If we assume the same rate for the whole thirteen years as for the last ten, as shown by the monthly reports during that period, it would make the total number of visits made or received by the physicians 109,665. The salary of physicians during this period was $47,711. This would make the actual cost to the members of the fund less than 44 cents per visit. This compared with twenty-five dollars a visit, the original cost, or even with the price that the inhabitants of large cities pay for similar service, is a very satisfactory showing. Now if we divide the total disbursements $79,522 11 by the total number of visits during the thirteen years, we have an average cost of 72½ cents per visit, including all expenses incurred by the Fund, such as medicine, nurses, loans, hospital-expenses, physicians salary and administration. All this has been secured practically without cost to the company.

To the Naturally Improvident Mexican

The establishment of the Fund has been of great value. The present arrangement saves both the miner and his family from considerable suffering in case of sickness or inability to work. The Cornish miners are usually more frugal, but they mostly have large families and get the full value of their contributions in the way of attendance during the year.

The Fund as now arranged seems well adapted to meet the peculiar conditions under which it operates with apparent general satisfaction. Dr. Winn, to whose kindness I am indebted for most of this information, tells me that during the four and a half years of his services at the mine he has heard of only two complaints. These were from two laborers who worked a couple of months on the roads, and did not happen to be sick while they were engaged. Considering the large and varied population, this absence of dissatisfaction is high praise for the manner in which the Fund has been administered.

Humboldt Niter Beds.

Colonel Birkedel, President of the Nevada Niter Company, organized for the purpose of working the niter beds in Elko and Churchill counties, has been inspecting the deposits near Humboldt Lake. On his way to San Francisco, a few days ago, in answer to an inquiry as to how the deposits here compared with those of South America, he informed the Reno *Gazette* that there is no resemblance. "The niter deposits of South America," said the Colonel, "are generally found in a crust of concrete called *caliche*, covering the surface of the more elevated spots of rolling plains, while here the niter is deposited in trachite and limestone, forming cliffs and hills often tinted by oxide of iron. You will understand by this that the niter was originally deposited in layers of heavy crust, and afterwards limestone was deposited over it, thus forming a cap. The niter beds of Nevada are far better situated for the development of its niter deposits than is the niter region of South America, which is a desert entirely devoid of water and all vegetable life. The development of its niter beds can therefore only be accomplished by surmounting difficulties. Provisions of all kinds must be furnished from distant countries. The water supply for all purposes must be condensed from ocean water and carried to the niter fields at great expense, while fuel has to be procured from the mountains in the south of Chili at great cost. While here the niter beds are in the vicinity of a rich farming country, with wood and water right at hand. We are, therefore, on an average able to produce niter, landed in San Francisco, at a much less cost than they are able to produce it in South America. We will be able to furnish all this coast requires, say 10,000 tons per annum, at a price that will net us $20 per ton profit." "How long will it be before you commence operations?" "As soon as possible, sir; our plans for machinery are all drawn, and everything will soon be ready."

CAPITALISTS are becoming interested in the mines of Plumas more than usual. The success of mines now operating, and the evident value of many of those owned by men too poor to operate them, are causing more attention to be given by the representatives of capital.

MECHANICAL PROGRESS.

Producing Compound Plates by Welding.

In compound plates, as heretofore manufactured from layers of hard and soft steel and iron, while uniting the hard material with the soft, and in the further manufacture of the plates when in a heated condition, a considerable proportion of the carbon passes from the hard to the soft layers. The object of manufacturing compound plates is thus to a great extent frustrated; furthermore, difficulties arise in the manufacture, because, according to conditions of temperature, more or less carbon passes into the soft layers, so that in many cases the requirements as to the amount of carbon to be contained in the plates are not obtained. To overcome this difficulty, Mr. F. A. Krupp, of Essen, welds between the hard layers and soft layers of compound plates a thin layer of such metal or metallic alloys as will prevent, or at any rate, much impede the passing of carbon from the harder into the softer layer. Such other suitable metals and alloys of metals as will, on the one hand, much impede the passing of the carbon, whilst, on the other hand, they will readily become welded to iron or steel or to chilled cast iron, are, for instance, nickel, cobalt, and highly silicious iron. He uses by preference sheets or plates of nickel, welded on both sides to sheets of iron, and thereby attains his object with a comparatively thin layer of nickel. The invention is applicable, not only to compound plates, but also to other articles which are composed of hard and soft kinds of steel and iron, and may be applied in various ways. As a rule, however, the conditions of temperature of the layers to be combined with one another must be so chosen that the intermediate layer is welded with the iron and steel, but is nevertheless not melted.

The simplest method of making such a plate is to make the intermediate plate as if it were a partition in the mold or form into which hard steel is poured at one side of the intermediate plate, whilst mild steel or homogeneous iron is poured in simultaneously at the other side. If it is desired to avoid the pouring in of hard and soft metal at the same time, then one material is first poured against one side of the intermediate plate, which is firmly fixed against the wall of the mold. The casting having congealed or set sufficiently, and being of suitable temperature, is then placed in another mold, and the other material is then poured against the other side of the intermediate plate. If, for instance, the compound plate is to consist of annealed or puddled iron and cast steel, then the welded plate, when it was being welded for the last time, has for its inside last layer welded to it, for example, a sheet of nickel, having welded on both its sides sheets of iron, and then casting on the other side of the welded plate a layer of steel in any convenient manner. Or the intermediate plate may be of highly silicious iron. The manner in which the process or invention must be modified, when the plates to be manufactured are to consist of several alternate layers of hard and soft material, is obvious.—*The London Mechanical World.*

A Mechanical Dictionary Needed.

There seems to be need for a dictionary of shop terms as well as of accepted scientific mechanical terms as applied to practice. Even in our most popular technical periodicals the terms used by a contributor from one portion of the country are sometimes unmeaning to readers in another portion.

Lack of definiteness is one of the faults of our mechanical nomenclature. In a recent publication of a mechanical paper, the question whether "spline," "key," and "feather" are synonymous was presented. Perhaps this will be as good as any other instance of our lax system or lack of system. In the shop talk where the writer was "raised," a "spline" would mean a fixed projected portion retained in a shaft and not specially connected with the pulley or hub. Its synonym would be a "feather." A "key" would be a wedge shaped fastener, with or without a head, fitting corresponding channels in the shaft and the hub, intended to secure the latter at some exact point. And yet "spline" and "key" are used indiscriminately by good mechanics. So long as the appellations are understood to have a definite meaning they have their value; but this value may be confined to the shop, to the section of manufacturing establishments, or to the manufactories where persons mainly of one nationality are employed; outside they may be confusing.

In shop use why should a cylindrical rod of metal be at one time a "bar," again a "shaft," a "spindle," an "arbor"? Or if so used, why not have a shop thesaurus or lexicon that would give the derivation of the words and the reasons for their use? A "bar" shows its origin; it means to hinder, and is applicable to iron only in bars which may be used as obstacles. A "spindle" is derived from the spinning flax spindle older than our civilization, which supposes a tapering shaft rotating on its own axis. "Shaft" comes from our Saxon schaft, an arrow, implying straightness. "Arbor" comes from the Latin, a tree, or a piece to which something may be temporarily affixed.

A "mandrill" is a hand (*manus*, *L.*) drill. Is the clearer of bored holes a "reamer" or a "rimmer"? Is the top of a machinist's hammer a "peene," "pane," or "pene"? Why a "broach"? Why "drift pin" and "tamp pin?" The suggested glossary ought to contain the information that the ordinary screw jawed wrench is not a monkey wrench because of any peculiar tricks it plays in use, but simply because Thomas Munkey, an English mechanic, invented it. Many other suggestions might be made to the ambitious mechanic who will undertake to simplify our mechanical nomenclature by the compilation of a dictionary and glossary of mechanical and shop terms.—*Scientific American.*

Recovering Tin from Scrap Tin.

Various methods have been devised for recovering tin from tin scrap, either with or without any attempt to further utilize the waste, by also saving the iron. A late English technical journal describes still another and new process from which the following points are gleaned:

"Melting the scrap gives only a spongy iron, and the extraction of the tin by the action of acids of chlorine gas is too expensive, so that hundreds of tons of this material are wasted every year, and all the experiments to save it appear to prove abortive. The latest experiments, however, seem to promise a cheap method of recovering both the tin and iron in a pure and useful shape. The tin scraps are placed in a furnace where the temperature and the supply of air can be carefully adjusted. This gives a roasting in free air that causes the film of tin on the iron to oxidize. The alloy of tin and iron under the film of tin is next oxidized, and then the scrap is taken from the furnace, and the coating of oxides on the iron is shaken off by simple machinery. This leaves the iron in a comparatively pure state, while the powdered oxides may be smelted with other tin ores, or, as is preferred by the inventor of the process, they may be submitted to the action of hot sulphuric acid, which dissolves the oxide of iron, leaving the tin untouched. The tin may then be separated from the solution of sulphate of iron and melted, while the solution may be evaporated to dryness, and then placed in retorts to recover the sulphuric acid, the residue in the retorts being valuable in making paints. The waste heat from the retorts is used to assist in roasting the scrap, and in evaporating the solution of sulphate of iron. Waste fruit tins are first roasted to remove the solder that may cling to them, and are then treated by the same process. The process is one that it may be hoped will save a great deal of money now lost without recovery, and do much to rid manufacturing cities of many unsightly heaps of refuse.

ATTENTION INVENTORS.—Robert Sinnicksou, of Trenton, N. J., writes to the *Scientific American* of June 28, 1884, as follows:—A serious accident in this city, this afternoon, from blasting rock, in excavating for the foundation of a new building, suggests the query whether some safer method than blasting may not be invented, for excavating in thickly populated cities. As crosscut saws are used for sawing stone in the yards, it occurred to me that circular saws, with both horizontal and perpendicular movements, might be used for cutting stone in its native bed, into small cubes, which might be used for building purposes. As similar accidents are following each other so rapidly in different parts of the country, it becomes philanthropists to agitate the subject, while it would probably pay inventors to consider it from a practical standpoint of view. Some practical invention is evidently needed for such excavations, and there ought to be inventive genius enough in the nineteenth century to produce it.

WHEN A CASTING IS VERY THIN, even if of soft grey pig, it is often as hard, even though run in sand, as if cast in a chill. Such castings may be annealed, so that the surface may be worked, by putting them in boxes and raising the temperature to redness. In the cast of gray iron the castings are surrounded with coarse sand, and heated for 48 hours; but in that of white iron they are surrounded by a mixture of one part of sal-ammoniac and twelve parts of hammer scales, and heated for 24 hours. This length of time is sufficient to soften the skin; but if the operation be continued for a week the castings will become malleable.

WINDMILLS still hold their own for many useful purposes. In fact, of late years, by reason of the numerous improvements which have been made in them, they have come more than ever into general use. In this connection it may be interesting to notice the fact that a competitive trial of windmills will take place at the Pennsylvania State Agricultural Fair the coming fall. The trial is to take place in Philadelphia, from September 8th to 20th. Mills may be erected after August 1st. There will be no charge for space, which is limited to ten feet diameter from out to out, of wings. Water will be furnished free.

KAOLIN FOR BOILER LAGGING.—A correspondent of the *American Machinist* says that the white clay or kaolin found in many parts of the South is used for boiler lagging with excellent results. He says: "I have seen locomotives covered with it placed in the house at 10 P. M., with 130 pounds of steam, and without fire, which showed 60 pounds of steam the next day at noon." The clay is mixed half and half with plaster paris, with jute to hold it in place. There are whole acres of kaolin deposits in this and Grass Valley townships.

SCIENTIFIC PROGRESS.

Oxygen in Water.

In a lecture delivered by Dr. William Odling, F. R. S., at the Royal Institution, on "The Oxygen in Water," the lecturer began by stating that in 1823 Faraday proved that a gas or vapor is nothing but a liquid at a temperature above its boiling point, and exhibited a number of glass tubes containing liquefied gases, which had been prepared by Faraday, who liquefied nearly every known gas. It is only within the last six years that the five or six gases which had previously resisted liquefaction have been reduced to that state by perfected modern appliances for producing cold and pressure. At the present time a chemist in Paris is making liquid oxygen by the pound. The speaker said that when gases are dissolved in water they somehow assume the liquid state therein, and increase the bulk of the water. At 0° C. 100 volumes of water dissolve 4.11 volumes of oxygen gas; at 15° C. they dissolve 2.99 volumes. At 0° C. 100 volumes of water dissolve 6886.10 volumes of sulphurous acid gas, and at 15° C. 4356 50 volumes; 100 volumes of water at 0 C. dissolve 114,800 volumes of ammonia, and at 15 C. 78,270 volumes. Water at a temperature of 7 C. dissolves 2,199 cubic inches of oxygen per gallon, and at 21° C. 1,797 cubic inches per gallon. The barometric pressure has a feeble influence in causing variation in the amount of oxygen absorbed by water, the variation not exceeding a small fraction of a grain per gallon; yet in a large river that means a variation in the quantity of oxygen to be measured by tons. River water in summer contains about 4 grains of oxygen per cubic foot, and about five grains in winter.

In August, 1859, Dr. W. Allen Miller ascertained the proportion of oxygen in the Thames at low water, and found that as the Thames runs through London the quantity of oxygen in it diminishes as compared with the proportion it contains at Richmond; and discovered that about 12 or 13 tons of oxygen are lost between Richmond Bridge and Somerset House. Other chemists have since taken up the work, and their results agree tolerably closely.

One method of testing the proportion of oxygen in water is by means of hyposulphite of soda. The hyposulphite of soda used in the analysis of water bleaches the ammoniacal solution of oxide of copper; it also deoxidizes indigo, magenta and iodide of starch. White indigo is made blue by the air in water, but does not do so if hyposulphite of soda is put in the water first to absorb the oxygen. When water is made blue by indigo, and hyposulphite of soda is added, the latter has the choice of two substances from which to absorb oxygen, and it deoxidizes the air in water first; hence the quantity of hyposulphite used before the liquid is bleached affords a method of measuring the proportion of oxygen in water. When the liquid is just bleached by adding no more hyposulphite of soda than is necessary for the purpose, it can be made blue by pushing down air into it, or by pouring it from one vessel to another.

Tests of the Thames water show that near the sewage outfall it contains about ½ cubic inch of oxygen per gallon, instead of 2 cubic inches per gallon, which it contains before receiving the sewage; but lower down the proportion of oxygen rises again, until the water is within 10 per cent of its richness in oxygen at Richmond.

OZONIZED AIR.—A novel and somewhat curious apparatus is about to be placed in a German hotel for the generation and diffusion, throughout the hotel, of ozonized air. It will be connected with a special system of ventilation which will be properly arranged throughout the structure. The air to be ozonized is passed by means of a fan driven by a water engine, through a chamber or generator, within which is a series of 50 glass plates fixed close together and coated with tinfoil strips, so as to constitute metallic gratings, and across the interstices of these gratings, the discharge of a large Ruhmkorff induction coil is passed in a multitude of little sparks. The induction coil is one of high insulation and capable of giving a spark in air between its terminals of 15 inches. Under the system of ventilation adopted at this enterprising hotel, the ozonized air is conveyed to the large *salons* and the theater, and is not only warmed to the required temperature, but is charged with aqueous vapor so as to maintain the saturation corresponding to that temperature at a healthy degree of humidity. By means of suitable valves, air properly warmed and charged with aqueous vapor and ozone can be turned into any room at the rate of from 2,000 to 3,500 cubic feet per hour for each individual.

EXTINCTION OF PLANTS.—The imminent danger of extinction which threatens many of the rare plants of the Swiss Alps has led to the formation of a society for their preservation. On reading the account of this society presented in another column, the question naturally arises, Are any of our rarer species likewise in danger of extermination? With the exception of the extensive raids which are annually made upon some of our native plants by herb collectors (and it must be understood that this business has assumed very considerable proportions, especially at the South), there are no very large drafts made which imperil the existence of the less common species. To be sure, in a few localities the mayflower and the climbing fern have been extirpated by the greed of collectors for the market; but it can hardly be said that these beautiful species are yet in peril. The same is true of the medicinal plants, ginseng and mandrake. It is fortunate that most species collected for medicinal purposes are reasonably prolific, and will doubtless hold out until those now in fashion have been discarded by other aspirants for popular and professional favor.—*Science.*

CURIOUS EXPERIMENT. Among the results of Dr. Guthrie's experiments concerning solutions of salts is, that as a mixture in solution cools, the salt which is present in richest quantity crystallizes out until a certain critical point is reached. Dr. Guthrie has shown that certain alloys of metal, such as the more fusible alloys, which melt at low temperatures, behave in the same way as mixtures of salts. Moreover, there seems to be no definite molecular proportion obtaining in these alloys: A mixture of 47.38 parts of bismuth, 19.97 of tin, 19.36 of lead, and 13.29 of cadmium fuses at 71 degrees Cent., or a little less than 160 degrees F., or in boiling alcohol. This is still a lower temperature than the fusing of Rose's fusible metal. Dr. Guthrie has also shown that definite mixtures of water and triethylamine become turbid at or between certain temperatures, and on this basis he has constructed a set of temperature tubes containing the mixtures in question. When placed under the tongue of a patient the temperature of the body at that point can be ascertained by their means.

MEETINGS OF THE BRITISH AND AMERICAN SCIENTIFIC ASSOCIATIONS.—As the British Association for the Advancement of Science meets this year at Montreal, from August 26th to September 2d, the American Association meeting will be held at Philadelphia, September 4th to 10th, to enable members of the two Associations to attend both meetings, and allow of the interchange of courtesies between the members. Fellows of the American Association are invited to join in the meeting at Montreal as honorary members, and those of the British Convention at Montreal are invited to take part in the Philadelphia meeting. Under those circumstances, both meetings are expected to be very fully attended, and the exercises unusually interesting. A series of receptions will be offered the Association at Philadelphia, and its guests, including one at the Academy of Music, after the President's address. The botanical section of the Academy of Natural Sciences will organize botanical excursions, and also hold a special meeting at the Academy for botanists.

INTERESTING OBSERVATIONS.—J. Aitken of the Royal Society, Edinburgh, employed the following experiments in illustration of the tendency of dust to move from hot and to deposit itself upon cold surfaces: Two mirrors, one hot and the other cold, fixed face to face and close to each other, were placed in a vessel filled with a dense cloud of magnesia, made by burning magnesium wire. After a short time the mirrors were taken out and examined. The hot one was quite clean, while the cold one was white with magnesia dust. In another experiment a cold metal rod was dipped into some hot magnesia powder. When taken out it had a club-shaped mass adhering to its end, while a hot rod attracted none. This tells us, among other things, why the walls and furniture of a stove-heated room are always dustier than those of a fire-warmed one. In the one case the air is warmer than the surfaces, and in the other the surfaces are warmer than the air.

THE COLOR OF INSECTS.—The relation of light color in the evolution of species of insects has been discussed by G. Lewis, who is disposed to attribute the origin of the colors of insects to the sun's rays rather than to sexual selection. He supposes a process by which the various rays or wave movements from the sun impress living organisms with the structure necessary for color, and terms it "photoplasticity," basing his supposition on the alleged sufficiency of this mechanical theory of the action of light to explain the phenomena of color. After giving many instances from the Insecta, of protective coloration, he speaks of Larahas, where the coloration is not protective, and states his belief that the latter are due to the sun's action.

THE AERONAUTICAL LEGACY, to which we have already referred in these columns, has actually been made, but it is in such terms that it is doubtful that it can be legalized. Mr. Ritchel, in whose special interest it was made, has not as yet received any portion of it, and he is not sanguine of obtaining a dollar from this source. The gentleman who thus showed, in his will, his interest in the experiments of Mr. Ritchel, had, during his life, voluntarily aided him with funds to a small amount, but at present Mr. Ritchel's costs are borne by himself.

NEW NEBULÆ.—It is claimed that over one hundred and fifty nebulæ which have escaped the vision of previous astronomers have recently been discovered by Dr. Lewis Swift, Director of the Warner Observatory, Rochester, N. Y. One of these is of a most peculiar nature, and seems to be undergoing a wonderful change.

MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO:
Staurday Morning, July 26, 1884.

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Passing Events.

There is not much of general interest to report from the mines, if we except the strike of gravel in the tunnel of the Bald Mountain Extension Company, Sierra county, in this State. The new town of Belknap, in the Coeur d'Alene region, Idaho, was burned up on the 18th, only five houses being left. The loss is set at $100,000.

The rescue of the Greely Arctic exploring party by the relief expedition was a timely one, the few that were left of the party being nearly starved to death. Many of Greely's men died from starvation, but he succeeded in getting nearer the North Pole than man ever went before. As far as we can learn, no very remarkable scientific results followed the work of this expedition, though open water was seen to the north of their farthest camp.

The cholera still prevails in France and Italy, though it has not come to this country. The President has issued a proclamation urging sanitary precautions on the part of citizens of the United States.

By the terms of the new arrangement between the railroad companies, the Southern Pacific sold to the Atlantic and Pacific its Mojave division, 240 miles in length, extending from Mojave to the Needles, and conceded to the Atlantic and Pacific the right to run its trains from Mojave to Oakland pier, a distance of 382 miles. By this contract the Atlantic and Pacific, which is owned jointly by the Santa Fe and St. Louis and San Francisco lines, extends its road to Mojave, and thus secures the right to run its trains virtually into San Francisco. The California Southern, now reaching from San Diego to San Bernardino, 130 miles, is to be extended to a junction with the Mojave division. It will then be formally transferred to the Atlantic and Pacific, which will thus be extended to the bay of San Diego.

After Mining Machinery Inventors.

A short time since we had occasion to call the attention of inventors to the many traps set for the unwary of their number, and of the numerous designs on their pockets which had been perfected by unscrupulous men. In most cases some plausible plan is set forth showing him it would be to the advantage of inventors to send on plans or models, accompanied by a fee, but there is never any mention of the possibility of the inventor getting the fee back again.

What appears to be an old idea in a new form has just come to our attention, and it is in such a shape that many may be induced to send the fee asked for without much thought of the matter. A circular has been issued by a committee of the Blank Consolidated Mining and Smelting Company, of Cincinnati, Ohio, in which attention is called to the great value of the mines of the company, which are in Colorado. This circular is sent to inventors of mining machinery and appliances all over the United States, the names and addresses, with dates of patent, having doubtless been taken from the Patent Office reports. The committee offers to send a prospectus of the company, and asks inventors to send their machinery to them if they wish to secure the practical introduction of the patent.

The circular says in effect that the directors of the company, after mature consideration, have agreed to adopt the latest improvements in mining machines and implements for the purpose of developing their several valuable claims to the greatest advantage. A committee has been appointed to report on these patented improvements; and, in order to select intelligently, they are authorized to call on owners of patents for models or drawings and specifications of their improvements. The company has decided to offer a premium of $500 cash for each patent which is adopted for use on its properties, and sets aside enough non-assessable stock to give each competitor twenty-five shares, value $10 per share. The object in transferring these shares to the inventors is to reimburse them for time and trouble, and to secure such a body of men as members who will co-operate intelligently with the directors in the management of the company.

The committee is empowered to charge each competitor an entrance fee of $15 for expenses of clerk hire, rent, etc. The fee must be forwarded with the models or drawings, and be there before the 1st of August. On choice being made, the inventor must sign an agreement to let the company use his invention in their mines, this to be delivered on payment of $500. Tags are sent ready addressed to the committee, and the inventor is again cautioned to prepay all models and send the $15 fee with them. They also ask for full names and correct address, so the stock may be properly transferred and forwarded.

This is quite an ingenious little scheme, and no doubt that committee will receive a number of $15 fees. It is not probable, however, many makers or inventors of mining machinery, furnaces, etc., on this coast, will send on any fees for the chances of getting wild-cat mining stock and a somewhat mythical $500. This is another one of the plans to get a large number of small fees from a large number of inventors, so as to roll up a goodly sum for some one. Paying out $500 or $2,500 for machinery or premiums on such a basis as this would be a good thing—for the promoters. But any inventor who sends money to people on such a slim chance of getting anything back as is set forth in this circular, will find he has been fooled, in all probability. It looks like another trap for inventors. At all events, owners of patent rights, before forwarding money to unknown persons, will do well to investigate the standing of the concern they are supposed to represent. The circular has apparently been sent broadcast to inventors of mining machinery, and they have evidently gone way back in the Patent Reports for addresses. The circular shown to us gave the date of the patent for the amalgamator in 1881, and the whole thing was printed except the name of inventors, class of invention and date of patent. Mining machinery inventors are cautioned to be wary of such schemes.

THE Oreana mill, formerly belonging to the Evening Star Co., is being moved to Paradise, Nev., to work ores from the Live Yankee mine.

Splitting Air Currents in Mines.

The splitting of the air current of a mine, when not carried to extremes, is advantageous, as it secures a greater volume of air at the expense of the same motive power. The different divisions of a mine are never equally developed; and, if proper care be not taken, districts requiring the most air will receive only a small portion, while other districts requiring but little will receive large quantities. Common sense suggests that of the two developed districts of a mine, the more developed of the two should receive the large quantity of air; the air should be therefore distributed in a systematic manner, basing the quantities for each district on to the number of bends, extent of rubbing surface and other resistance. This aim is attained by the "sliding shutter" which, being placed so as to admit a small volume of air, causes whatever excess there may be to pass into other parts of the mine where the air is more needed.

It may happen that in a coal mine a "blower" of gas is met with which renders the air explosive in its district. When it is perceived the regulators should be immediately opened and a greater circulation produced, in order to carry away the inflammable gas. During this time work in other districts need not be necessarily stopped, unless it is found necessary to pass the whole current through the dangerous district.

If the gases be given off in such quantities that an explosion takes place before the miner perceives the explosive state of the air, the workmen in the other districts will be protected from the flame of the explosion, and the "after damp" will only momentarily check the current; and if the return airways are of large sectional area and no great length, the current will scarcely be interrupted, save perhaps in the district where the explosion occurred, the doors and regulators of which may have been destroyed.

To increase the ventilating pressure, or lessen the extent of rubbing surface, is a costly manner to increase the ventilation; but by judiciously dividing the current and evading it with several air-ways, the circulation will be much more active than if only one continuous current were used. In Mr. Wilson's recently published work on "Mine Ventilation," formulae presented prove "that the resistance to the motion of the air in a mass requires in a single current, a motive force sixty-four times greater than when the air is divided into four currents of the same sectional area and aggregate length." The same is said to be true for bends and contractions that require a motive force equal to the square of the volume of air circulating in each district. By splitting the air current, or leading it off from the downcast into the different districts to be ventilated, we obtain purer air for each district; for each split takes its fresh air directly from the downcast. We obtain more air also by decreasing the velocity, thus lessening the friction.

The Judson Manufacturing Co.

The extensive works of the Judson Manufacturing Co. are at Emery Station, Alameda Co., between Oakland and Berkeley, on the line of the C. P. R. R. The enterprise is a very prosperous one, and pays regular dividends to its shareholders. The plant is one of the largest of any manufacturing establishment on the coast, and is being constantly added to. There are a number of departments, presided over by skilled foremen, all under one general superintendence, however, and each department is separate in itself. The works are run on a careful system and in a very business-like manner. The products are favorites in the market, owing to the excellence of the standard established and maintained.

One of the products worthy of special notice is the California Victor mowing machine, well known on this coast. Another is Beauregard's patent channel-iron harrow. Mr. Beauregard, the patentee of this harrow, has also patented and put in use at these works a machine for straightening and smoothing round bar iron, by which the trade of the company in that line of goods has been increased to four times its former dimensions. This machine smoothes and straightens the iron, and fits it for shipping, saving the expense of the old process of straightening, and has given the Judson Co. a great advantage in the manufacture of bar iron for shafting.

Inspection of Mines.

As we have before observed much greater attention is paid in Europe than in this country to official inspection of mines. In Great Britain and on the Continent the government exercises functions in this respect which our government does not. There they have government inspectors who attend to certain stated duties in this connection. Last month representations of the miners of all parts of Great Britain waited on a committee of Parliament to urge the appointment of additional inspectors of mines. The memorial of the deputation set out that although the production of coal was last year one-third greater than in 1872, there had been no increase in the number of mining inspectors. The tendency of the present day was to engage in operations which rendered inspection much more important than formerly, and it was represented that the pressure of duty did not enable inspectors to give to individual cases that attention which was desirable in order to secure as far as possible immunity from accident. It was therefore asked that there should be a reasonable increase in the number of government inspectors.

The deputation also addressed the Home Secretary, and a portion of his reply is worthy of reproduction: He said, "Everybody knows that all the motive power of all the industries of the country is mainly to be found in coal, and that therefore those who get the coal are among the chief springs of the industry and wealth of this country. I am also aware—I am obliged to be so officially—of the great risks and dangers of that trade and the melancholy loss of life that frequently occurs in it. Now with reference to what has been said as to inspectors, I have myself sometimes thought that there was a very reasonable claim for an increase of inspection, for this reason—that unquestionably the output is much larger, the workings are more extensive, the depths at which the coal is obtained are greater than they used to be.

"There has been a demand made that these inspectors, or a portion of them, shall be practical men. I think that I have not been insensible to that, and that in other departments of inspection I have shown that I desire first of all, that men practically acquainted with the work should have a share in it. But I have another and larger reason—I think that all classes in the community, and especially those who themselves take part in those industries, should have a share in the civil service of the country. Having said this to you, I must ask you not to expect the government to do the work which ought to be done by others. Do not expect too much from the government. If the government were once to undertake the main responsibility—the daily, hourly responsibility, which alone can make a trade of this kind safe—they would utterly fail. They would destroy the responsibility of those people upon whom it must eventually rest, because once allowed the owners and managers of mines to say, 'We have had an inspector here; it is not our fault, and he has approved of what is done'—it would destroy, in point of fact, that responsibility which must be the main safeguard of carrying on a business of this description.

"You must not expect that government inspection can take the place of that responsible care which must devolve upon the parties who have charge of the mines; and it would be a very great evil if you went so far as to destroy that responsibility, because you all know, especially persons from South Wales, where there are fiery mines, that a mine that is safe to-day may be very dangerous to-morrow, and that after the inspector is gone a single pick may bring out a piece of coal which may let out gas and make absolutely dangerous the mine which, a day or a week before, was safe as far as human skill and foresight could make it. There is another thing which I am sure you will excuse me for speaking quite frankly about, and in which I would ask the miners to help us. I have had—I will not refer to particular men—cases where the inspectors have reported to me that certain precautions were necessary, such as locked lamps, and, of course, I had no other course left me but to say that the inspector had reported to me that locked lamps were necessary, and that the locked lamps must be used in place of the unlocked lamps. Well, that order has given great dissatisfaction, and I have found it resisted by the men who work in the mine. However, I am very glad to hear from you that you are not dissatisfied with the work, so far as it goes, of the existing inspectors, and I shall convey that sentiment on your part to them."

Indians Near the Colorado Canyon.

Major Powell during his exploration of the Colorado river of the West, gained many very interesting facts concerning the Indian tribes living in that region. He traveled for many months in a country where it is doubtful if white men ever before went and visited the camps and villages of many tribes of Indians. He speaks of camping near the Grand canyon where there were some Indian neighbors. During the inclement weather these aborigines live in shelters made of boughs or bark of the cedar which they strip off in long shreds. In that climate most of the year is dry and warm, and during such time they do not care for shelter. Clearing a small circular space of ground, they bank it around with brush and sand, and wallow in it during the day, and huddle together in a heap at night, men, women and children, buckskin, rags and sand. They wear very little clothing, not needing it in the lovely climate.

Altogether these Indians are more nearly in their primitive condition than any others in the continent with whom Major Powell is acquainted, and no one has had more experience than he has. They have never received anything from the government, are too poor to tempt the trader, and their country is so nearly inaccessible that the white man never visits them. The sunny mountain side is covered with wild fruits, nuts and native grains upon which they subsist. The *ooze*, the fruit of the Yucca, or Spanish bayonet, is rich, and not unlike the paw-paw of the valley of the Ohio. They eat it raw, and also roast it in the ashes. They gather the fruits of a cactus plant which is rich and luscious, and eat them as grapes, or from them express the juice, making the dry pulp into cakes, and saving them for winter; the wine they drink about the camp-fires.

They gather the seeds of many plants, as sunflowers, golden rods and grasses. For this purpose they have large conical baskets, which hold two or more bushels. They put the seeds with a quantity of red-hot coals into a willow tray, and by rapidly and dexterously tossing them, keep the coals aglow and the seeds and tray from burning. As if by magic, so skilled are the crones in this work, they roll the seeds to one side of the tray as they are roasted, and the coals to the other. They then grind the seeds into fine flour, and make it into cakes and mush. For a mill they use a large flat rock, such as is shown in one corner of the accompanying engraving, and another small cylindrical one in their hands. They set prone on the ground, hold the large flat rock between the feet and legs, then fill their caps with seeds, making a hopper to the mill with their dusky legs, and grind by pushing the seeds across the large rock, where it drops into a tray. There is very little game in the country, yet they get a mountain sheep or deer occasionally. They get many rabbits, sometimes shooting them with arrows, and occasionally with nets. In the autumn the grasshoppers afford them food.

Gravel in Placer County.

EDITOR PRESS:—Geo. Lee about three miles south of Pino, three years ago last winter, sunk a shaft on his gronnd and at a depth of 54 feet struck a bed of ancient silver gravel which proved to be gold bearing about four feet thick, and which averaged in shaft from eight to ten cents per pan. About two years ago he commenced a tunnel from side of hill below shaft, first running open cut through granite 150 feet, then tunnel nearly 200 feet through granite and about 300 feet through sedimentary stratum of sand and pebbles mixed. At about 250 feet from entrance gravel comes in over head and gradually and unevenly falls till in neighborhood of shaft, when he finds gravel bed from three to seven feet in depth and resting on the sandy and pebbly stratum before mentioned which underlies all the old river bed.

Mr. Lee washed out about 260 cubic yards from which he cleaned up over $2,600. The bed seems to be extensive with a width of about 60 feet, averaging perhaps about four feet in depth. Mr. Lee has just commenced work again with most flattering prospects of a valuable property. M.

Placer Co., Cal.

INDICATIONS are favorable for plans, specifications and the early completion of a mill at Mono Lake for the working of the low grade ore of Aurora. Certain capitalists are convinced that the scheme will prove fruitful of big results.

Wrought Iron and Steel in Construction.

A little work containing convenient rules, formulæ and tables for the strength of wrought iron shapes used on beams, struts, shafts etc., manufactured by the Pencoyd Iron Works, Philadelphia, has been issued by John Wiley & Sons, N. Y. It will afford information on many points to engineers and builders in iron and steel. As far as possible doubtful points were corroborated by experiments, and especially the article upon "Struts" is based on the result of several hundred carefully conducted experiments at Pencoyd. We extract the following remarks on "Structural Steel:"

The various grades of steel used in structures possess such an extended range of physical properties that it is impossible to present as definite a base of strength, stiffness, etc., as can be given for wrought iron.

The character of the material is largely determined by its combination, in minute proportions, with various substances, the most important of which is carbon.

The grades below .15 per cent carbon are known conventionally as "mild steels," owing to their high ductility and to their possessing but very moderate hardening properties when chilled in water from a red heat.

The mild steel has also superior welding properties, as compared with hard steel, and will

INDIANS NEAR THE COLORADO CANYON.

endure higher heat without injury. As a general rule, the greater the percentage of carbon in the steel the higher will be its tensile strength and the lower its ductility. The following list exhibits the average tensile resistances of steel having given proportions of carbon:

PERCENTAGE OF CARBON.	Tensile Strength in Pounds per Square Inch.		Ductility.
	Ultimate Tenacity.	Elastic Limit.	Ultimate Elongation in 8 ins.
.10	60,000	36,000	26 per cent.
.15	66,000	40,000	24 per cent.
.20	74,000	45,000	22 per cent.
.25	82,000	50,000	20 per cent.
.30	90,000	55,000	18 per cent.
.35	100,000	60,000	16 per cent.
.40	110,000	65,000	14 per cent.

These figures, however, are only approximate, as much depends on the quality of the steel, and also the extent to which it has been worked in the rolling process.

Steel whose carbon ratio does not exceed .10 per cent should be capable of doubling flat without fracture, when chilled in the coldest water from a red heat.

Steel of .12 carbon should endure similar treatment when chilled in water 80 degrees F.

When the carbon percentage is .15 the steel should be capable of bending at least 90 degrees, over a curve whose radius is three or four times the thickness of the specimen operated upon, and after being chilled from a red heat in water of 80 degrees F.

Steel having .35 to .40 per cent carbon will usually harden sufficiently to cut soft iron and maintain an edge.

There is much variation from the aforesaid hardening properties in different qualities of steel, as much depends on the influence of other hardening agents besides carbon.

The modern tendency is to limit the use of steel for structural purposes to the milder grades of the material. For steel in steamships the United States Government specifies as follows: "Steel to have an ultimate tensile strength of not less than 60,000 pounds per square inch, and a ductility of not less than 25 per cent in 8 inches. The test piece to be heated to a cherry-red and chilled in water at a temperature of 82 degrees F. After this it must be capable of bending double flat under the hammer without cracking." It requires about .11 to .12 carbon steel to endure this test.

"Lloyd's" rules require the steel to have an ultimate tenacity of not less than 60,000 or not over 70,000 pounds per square inch, with an elongation of at least 16 per cent in 8 inches. This steel, when heated to redness and chilled in water of 82 degrees F., must bend double without fracture around a curve of which the diameter is not more than three times the thickness of the piece tested. For a cold test without hardening, the material must be capable of doubling flat and bending backward without fracture.

Angles and beams for ship frames may have a tenacity of 74,000 pounds, providing the bending tests are satisfactory, and the welding property is unimpaired. It requires about .12 to .14 carbon steel to meet these specifications.

We present the average results of experiments on the strength and elasticity of "mild" and "hard" steel; also the comparative resistance of these materials in the form of struts. The "mild steel" had an average carbon ratio of .12 per cent, and the "hard steel" an average carbon ratio of .36 per cent. The average strength and elasticity of wrought iron is inserted for the purpose of exhibiting the characteristics of the steel and iron. As in the case of the steel, the several values given for iron are the results of a few special experiments:

MATERIAL.	Tensile Strength in lbs. per Square Inch.		Ductility.	Modulus of Elasticity in lbs.
	Ultimate Tenacity.	Elastic Limit.	Elongat'n in 8 ins.	
Iron	51,000	31,000	16 per ct.	28,400,000
Mild steel	64,000	37,100	23 per ct.	29,300,000
Hard steel	92,000	56,700	18 per ct.	29,280,000

From the same material the following results for compression were obtained:

COMPRESSIVE RESISTANCE.		
MATERIAL.	Elastic Limit in lbs. per Square Inch.	Modulus of Elasticity.
Iron	29,500	27,090,000
Mild steel	37,400	24,760,000
Hard steel	55,700	24,570,000

THE *Appeal* says Marysville is still a shipping point for a large scope of country, as will be seen from the following list of towns: Sierra City, Downieville, Goodyear, Indian Hill, Camptonville, Oak Valley, Brownsville, Strawberry Valley, Scales, La Porte, Gibsouville, St. Louis, Howland Flat, Poker Flat, Forest City, Alleghany, San Juan, Birchville, French Corral and Willow Glen. Thousands of tons of freight are annually sent to these various points. Some of the firms ship as high as 500 or 600 tons per month. The tonnage of shipments must reach as high as 30,000 or 40,000 tons per year.

THE new claims on the Little Walker river are situated some little distance above where the toll road crosses the Little Walker, and where two creeks flow into the river from the westward. An old prospector from Aurora met Joe Kingsley at the old Dog Town diggings in 1859, and urged Joe to examine this same ground, and exhibited some fine specimens, but for some reason it was neglected until recently. There are said to be good placers, and that the ore goes $30 per ton.

Gravel Mining.

It is by no means the case that all the hydraulic mines in California are shut down. We gave an account last week of the operations in Trinity county. But in many other counties the mines are working also. The feeling against hydraulic mining is by no means as great as it was. The people of the State are even now beginning to feel the effects of the stoppage of the big mines. Money is by no means as plenty as it was, and the product of a million of dollars or so a month which we formerly had from this source is missed. The people who hold the agricultural land in the vicinity of the mines see too that they will be better off with a lot of miners to sell their product to, and begin to think that an entire suppression of hydraulic mining will not be as good a thing as was supposed.

In fact, in a number of places the miners have been buying the right to dump their tailings, so as to be able to work their claims. This is mostly in the cases of comparatively small claims of course. The miners seem to think it cheaper to submit to a limited amount of extortion than to go into litigation. They would rather pay liberally to get what they want than to go to law. The agriculturists are benefited by this, of course, for they get a part of the yield of the mines, as well as the crops they sow and reap themselves.

This is rather a curious state of affairs, but it exists in more places than many would suppose. It is of course disappointment to the lawyers, and to the more rabid opponents of the miners. But it is a fact, nevertheless, that this is being done.

Two Lodes in One Application for Patent.

In reversing the decision of the Commissioners of the Land Office in a recent case, the Secretary of the Interior has decided that a lode claim application for patent may embrace two or more lode claims. But this ruling applies only to cases arising before the circular of instructions of June 8, 1883. This ruling (though the reverse of former ones) has become necessary in view of recent judicial interpretations, especially those of the United States Supreme Court. In the case of the Smelting Company *vs* Kemp it was decided:

"The last position of the court below, that the owner of contiguous locations who seek a patent must present a separate application for each, and obtain a separate survey, and prove that upon each the required work has been performed, is as untenable as the rulings already considered. The object in allowing patents is to vest the fee in the miner, and thus encourage the construction of permanent works for the development of the mineral resources of the country. Requiring a separate survey and notice, where several adjoining each other are held by the same individual, would confer no benefit beyond that accruing to the land officers from an increase of their fees. The public would derive no advantage from it, and the owner would be subjected to onerous and often ruinous burdens. * * * It was, therefore, very natural, when patents were allowed, that the practice of presenting a single application with one survey of the lode tract should prevail. It was at the outset, and has ever since been, approved by the Department, and its propriety has never before been questioned. Patents, we are informed, for mining ground of the value of many millions of dollars, have been issued upon consolidated claims, nearly all of which would be invalidated if the propositions assumed by the defendants could be sustained."

CONSOLIDATED LOCAL MINING OFFICERS.—W. S. Bender, Chief Clerk at the Ophir office, in this city, resigned his position last Tuesday, and turned over his books to W. H. Lowell, who took his place as Secretary of the Bonanza firm, vice J. Minor Taylor resigned. Mr. Lowell, assisted by J. A. O'Donoghue, will now transact all the business of the Union Consolidated, Sierra Nevada, Union shaft, Ophir, Mexican, Consolidated Virginia and California mines at the local office of the Consolidated Virginia mine. *Virginia Enterprise.*

A NUMBER of miners have left Newcastle, Great Britain, for China. The system of emigration, it is interesting to note, has been going on among northern miners for the past few years. Not many of the men of Northumberland and Durham have ventured to China, but it is a positive fact that thousands within the past five years have emigrated to the United States, to Canada, New Zealand and other places.

IN June, seven California quicksilver mines yielded 2,694 flasks of quicksilver, of which the New Almaden produced 1,859 flasks.

The Block System of Underground Prospecting.

The plan of development that has been practiced in certain very large and important veins, by opening drifts in or parallel with the course of the ore channels and cross-cutting from the main drifts at intervals of from fifty to one hundred feet, thus dividing of the ground exposed into blocks, is one that results in an apparently methodical and workmanlike system. By following it, the main openings are kept straight, and, when a large body of ore is struck, its extraction is much facilitated by the plan of operations that has been conducted during the prospecting period. Unfortunately, however, there are few mines that can be economically opened and developed in this way. The system appears to be the only one feasible in cases like that of the Comstock lode, where the widtb of the ore bearing ground is very considerable, and the o e occurs in detatched bodies, giving few indications of its presence until the mass itself is struck. A company having large capital and extensive plant often proceeds to develop narrow veins on the same plan, when the more natural and practical method would be to strictly follow the vein on each level, provided good working ground is found on the course of the vein itself, and to keep all workings, such as uprises and winzes, within or as near as possible to the ore region. The objections to this method are, that the workings are crooked, and often extremely tortuous; that the distances, from point to point, are sometimes considerably increased; and that the appearance of the mine, to one who has been accustomed to the system of cross-cutting in blocks, is wanting in the regularity of the latter method. On the whole, however, the chances of finding ore, and at all events of missing as little of it as possible, are much increased by working, so far as practicable, entirely in the ore channel. It should be remembered that the only objects of mining at all are, in the first place, to find, and, in the second, to extract ore. The latter pa t of the work can be easily enough managed after development has proceeded to such an extent as to show reason for changing the system of openings in any way. It certainly seems absurd to proceed to open a mine on the grand scale that would be appropriate in handling enormous bonanzas, when, by adopting the more economical method, a small but certain profit could be assured. The Mexicans, who are miners born, and not by education, and who have the keenest instinct for following indications of ore, limit the size of their prospecting drifts to the smallest possible dimensions, so that often they have the appearance of burrowings rather than of systematic mine openings. It is not necessary to adopt their system in its entirety, nor to carry it to that extreme that results in the making of gopher holes, through which a man has to pass on his hands and knees; and on the other haud, it is perfectly feasible, having once found ore in quantity, to stope it out and raise it by our most approved methods. But there is no doubt that much could be learned in the way of economy and practical success from the primitive and despised, but very efficient, methods of mining of the Mexicans.

In working argentiferous lead deposits in limestone, cross cutting in blocks is a most uncertain means of prospecting; for the stringers and pipes that serve as leaders to the main bodies are easily missed by drifts; and unless the galleries are very numerous and close together, unexplored places are left that might contain profitable ore bodies. At Eureka, Nevada, the two opposite systems have been pursued in the same district. The Eureka Consolidated Company has, as a rule, conducted its prospecting operations on the plan of following ore indications, with little regard to the regularity of its drifts. The Richmond Company, adjoining, has pursued the course of laying off its ground in blocks and cross cutting for ore. These cases, however, show little to decide the question of relative success; for both companies have been very fortunate, and the cross cutting system, owing to the immense size of the ore bodies, has been followed under exceptionally advantageous conditions. Where ore exists in such large masses, it is not a difficult matter to find it, no matter what system he adopted; but it is safe to say that in most lead mining districts blind cross cutting would be neither the safer nor the more economical plan.

A parallel extravagance is sometimes committed in locating shafts at too great a distance in the hanging wall country from the outcrop of the vein's medium dip, the object being to develop the ground at the greatest possible depth by a single shaft. Very often, in cases where the undergrouud features are not well known, the more sensible plan would be to follow the vein down by an incline on the dip. Having once struck a bonanza of size sufficient to warrant it, the siuking of a vertical shaft in the proper place becomes a simple matter, and the cost of pushing shafts and other openings in barren country rock is justified by the developments; but in exploiting claims that can only be classed as prospects, the shortest and most economical means should be pursued. Mining on the grand scale is being steadily supplanted by more practical and less pretentious means.—*Albert Williams, Jr., U. S. Geol. Survey.*

Working Iron Beach Sands.

Mr. Jas. Davis, of the Mossend Steel Works, England, has written the following letter to a number of English technical journals:

For many years past the deposit of iron sand, both on the shores of New Zealand and of Canada, has been the object of much solicitude on the part of the governments of these countries, who have endeavored to use this raw material, which is so rich in metallic iron, and of which there is an almost inexhaustible supply, to a commercial advantage. It was urged that the absence of suitable fuel within reasonable distance of the deposits would always he an insuperable obstacle in the way of using up the sand on the spot; yet that obstacle, serious as it seemed, would appear to be overcome, as coal and slack from Waikato may be obtained that is suitable for gas producing.

Having experimented with these sands, I have been able to obtain good and satisfactory results, both as to its qualities in iron and steel, either by working it into finished merchant bars or converting it into soft steel by the Siemens open-hearth furnace, or by making crucible steel of a high quality. I treated the sands as under: After working the sands in the Siemens rotary furnace, reduced with charcoal or soft coal, the balls were hammered into blooms; these were rolled into good merchant bars suitable for the market. To produce crucible steel, bars were cut up into small pieces, which is usually done, and melted in crucibles, the production of which was a very fine quality of steel. For producing mild steel for plates, etc., in the Siemens open-hearth furnace, the balls were taken from the rotator and hammered or squeezed into blooms, then charged with the exact proportion of pig iron, and gave excellent results; and so far as my experience has gone with treating ores of almost every nation directly, both hy puddling and with the revolving process, I have found nothing so well adapted to treat directly as these sands.

It has been proved by experience that to work ores or magnetic sands directly they must contain a high percentage of metallic iron. This we have in these sands, as the appended analysis shows; and although so much has been expended in these countries in experiments to work up these sands, yet I have not read of any proving successful. To puddls is by far too slow a process, and too expensive. What is required is a process that will be able to meet the dsmands of the country; and as the Siemens furnace has now passed its experimental stage, it can be built so that with one rotator 30 tons of blooms a week can be made.

ANALYSIS OF TITANIC SAND.

Peroxide of iron	67.04	= Iron 70.4
Protoxide of iron	30.17	
Oxide of manganese	.22	
Alumina	.16	
Lime	Trace	
Magnesia	Trace	
Titanic acid	1.64	
Sulphuric acid	Trace	
Phosphoric acid	.03	
Silica	.51	
Moisture	.14	
	99.91	

The principle of this Siemens furnace is well known. It will therefore suffice to say that, with a little improvement in its construction, which practical experience has suggested, it could be made to work for three months or more without undergoing any repair. Moreover, with this process no skilled labor is required; therefore the cost for labor would be very low. This alone is a great advantage, as it is the high price paid for labor in some of our manufactories that prevents us from being able to compete with foreign countries; in fact, with working two or more rotators jointly, blooms could be produced at a cost of 5s. per ton for labor. The Wilson furnace, an American invention, has been successfully tried in New Zealand.

Gold Chlorination in California.

Under the above title, Mr. F. D. Browning, E. M., describes, in the last issue of the *School of Mines Quarterly*, the plant and the method of working at the Providence Mill, Grass Valley, California. The rock is quartz, carrying on an average seven per cent of sulphurets, chiefly pyrites. It goes without sorting to the grizzlies, the coarse stuff being delivered to the rock-breakers. From the bins the ore is fed by Hendy automatic feeders into the batteries of the 40-stamp mill. The stamps drop seven inches, 96 times a minute, their weight being 750 pounds. They crush through a No. 5 punched screen, equivalent to a from 30 to 40-mesh sieve. The free gold is amalgamated in the battery and on silvered copper plates, which are inclined one and three-fourths inches in a foot, this steep pitch being employed to keep the plates clean and yet avoid the use of to much water, which would flood the concentrators. They have the full width of the battery, and are four feet long. Beyond them, are two sluices, each 16 inches wide and 14 feet long, having the same pitch. The pulp is carried through launders to Frue vanners, there being two to each battery, or sixteen in all. The concentrates, which contain as a maximum 10 per cent of sand, are dried and then go to the chlorination-works. They are reported to carry $120 in gold and $12 in silver per ton. The sulphurets are roasted in two-story furnaces, with a third hearth on top of the furnace, the latter acting as drier and pre-heater.

The ore is roasted in two-ton charges, remaining twelve hours in the second hearth and four hours in the bottom hearth. Ths temperature is allowed to go down, and one per cent of salt is added. One man works one furnace in eight-hour shifts. The roasted ore is sieved and is put into tubs holding two and a half tons of ore. For each of these as much chlorine is used as can be produced from eight pounds of black oxide of manganese, 22 pounds of salt and 16 quarts of 66 Baume sulphuric acid. When chlorinated, after two or three days, the gold is washed out with water, and precipitated with sulphate of iron. The silver remaining in the residues, chiefly as a chloride, is extracted with hyposulphite of lime, and is precipitated with calcium polysulphide. It is claimed that 94 per cent of the gold and 60 per cent of the silver is saved.

The mill is run by a six-foot Pelton hurdy-gurdy, driven with 104 inches of water under a 390-foot head, costing 16 cents an inch, so that the power costs $16 64 a day. The batteries, concentrators, and chlorinatiou-works take five inches of water.

Mr. Browning estimates the cost of milling as follows:

COST OF MILLING AT THE PROVIDENCE MILL.

Three men at rock-breakers at $2 25	$6 75
Three men at batteries at $2 25	6 75
One man at concentrators at $2 50	2 50
One foreman	3 50
110 inches water at 16c	17 60
Wear on shoes (steel at 11c. per pound)	6 11
" " dies	3 42
" " screens	3 87
" " rock-breakers, concentrators and copper plates	5 00
Illuminating	1 00
Lubricating	1 00
Total	$57 50

The average quantity of ore milled per month is 1850 tons, or 62 tons per day, which brings the cost of milling and concentrating to about 93 cents a ton.

Mr. Browning puts the immediate daily expense of the chlorination-works, which have a maximum capacity per day with two furnaces of 9 tons, as follows, when running at full capacity:

One foreman	$3 00
One white laborer	2 25
Five Chinamen, at $1 50	7 50
Two cords wood, at $5	10 00
20 pounds binoxide manganese, at 2½c	80
360 " salt at 1c	2 60
216 " sulphuric acid, at 2c	4 32
Lime, Sulphur and calcium hyposulphite	30
Illuminating	20
Extras	1 00
	$31 97

The mill, however, produces only 4½ tons a day; but as the works are kept running, the actual cost is higher, the estimate based upon 4½ tons per day being:

Labor	$12 75
Two cords wood	10 00
Fourteen pounds binoxide of manganese	38
126 pounds salt	1 26
104 pounds sulphuric acid	2 08
Lime, sulphur and calcium hyposulphite	15
Illuminating and extras	70
Total	$27 32
Cost of milling	57 50
Total outlay per day	$84 82

or $1 37 per ton, not including general expenses, interest on and depreciation of plant.

Shipping Ores to Kansas.

The Prescott (Arizona) *Courier* says:—As this portion of Arizona is without general reduction works, owners of rich silver mines have been compelled to ship their ores to Pueblo, Colorado, and Bensou, in Southern Arizona, in order to have them treated in a proper manner. The cost of shipping has been, is yet, a heavy tariff on the richest ores; still we have not heard of a single miner who has shipped at a loss. This fact speaks well for the richness of our ores. F. W. Blake, of the First National Bank, was the first citizen of Prescott to make the shipping ores a regular business. His efforts have, of course, helped our country and its miners. He still attends to the business for his bank and will, we hope, continue to do so.

About the first of next August, Douglass Gray, an assayer and metallurgist, will commence purchasing all kinds of high grade ore for the Boston and Colorado Smelting Company, of Argo, Colorado, and for the Kansas City Smelting and Refining Company, of Argenta, Kansas. He is local agent for these two companies and will have their active assistance in the matter of getting cheap freight rates, etc. These two companies are entirely responsible, as is, also, Mr. Gray. Assaying, sampling, everything will be done on the square, so that prospects are now fair for more active mining and better times in this part of Arizona. Mr. Gray will make liberal advances on all shipments of the value of $100 and upwards.

While the *Courier* would like to see the rich ores of our mines treated at home, it freely admits that, in our present emergency, the best we can do with them is to let Mr. Blake and Mr. Gray ship them to the general smelters.

THE assessment roll of the property of Nevada county has been nearly made up for the current year, and it is found that the decrease in valuation from the previous year will be about $1,400,000.

THE hoisting works of the Delaware Mining Co. on American Flat, Nev., were burnsd last week.

The Tanite Co.

The dull times and blue outlook have not lesseued the activity of this substantial concern. The recent visit to Europe of Mr. T. Dunkin Paret, the President of the Company, completed arrangements, by which its European trade will be doubled during the coming year, and shortly after be quadrupled. In view of this fact, and of the successful business transacted this year (which most manufacturers have found a bad one), the company is now arranging for a large extension of its factory. This factory was started in the year 1867, by the erection of a stone building, 45 feet long and 32 feet wide, two story and attic, with boiler shed extension. The total floor room of the original buildings amounted to 5,550 square feet. Ths flooring nsed at the present time is 34,190 square feet. The new building, for which preparations are now making, will be an extension of, and the same size as the original stone building. It will be a substantial structure of stone, supported by heavy iron arches, which are to span the wheel pit and overflow.

In order to extend and more thoroughly control the water power, and to secure timber and stone for further operations, the company bought during last month from Mr. Robert Huston, his farm of 130 acres, which adjoined the company's original property. The total amount of land now connected with the Tanite factory is about 180 acres, and the Pocono creek flows through it for the distance of about one and three-quarter miles.

On the property recently purchased, the company is now cutting timber for the preliminary work connected with the improvement of its water power. A new breast-work, cribbing and flume are to be erected at the dam, and new fore-hay and penstock at the factory. This latter is to be larger and more substantial than the present one; the heavier, or corner and sill timbers, being 14x16 white oak. At present the factory has, in addition to its steam power, a 42-inch Jonval turbine; but, in the new penstock, a 24-inch Stevenson duplex turbine will be added, and by means of these three motors the various departments can be run independently when desired.

During the last summer the company put in operation a complete fire system. Iron pipes are laid under ground all around the buildings, and are connected with three pumps situated in different buildings, one detatched: one double acting Worthington Steam Pump, one Niagara Steam Pump, and one powerful pump run by water power. Five plug or hose houses stand scattered around at a safe distance from the buildings, containing in all twelve plugs or nozzles, and 650 feet of 1½ inch, and 200 feet of 2 inch hose. Fire-axes are in all these houses, and fire-pails and axes liberally distributed through the buildings. Streams of water have been thrown upon the building in *one minute and forty seconds* after the first signal was given.

On its fields immediately adjoining the factory the Company continues its efforts, still considered experimental, in the culture of Lima beans, and has in, this year, ten thousand five hundred hills, (10,500) all of which promise better than at any past season. It is also raising several kinds of corn new to this country, and intends to sow in the fall all of the new thousand fold rye which it raised last year.

For the benefit of such reade s as may not have seen any previous notice of The Tanite Co., we will say that it manufactures Solid Emery Wheels and the varied machines with which such wheels are applied, and that its goods are shipped to all parts of the world. It has agencies in all the principal cities of the United States, and also in Canada, Australia, and France, besides sub-agencies in many European and other countries.—*Stroudsburg (Pa.) Jeffersonian.*

APEX OF A LODE.—Among the important questions adjudicated in the recent and already noted Nest Egg and Eureka case, Colorado, the following merits special mention: "If all the necessary acts are not done within the time provided hy-law then the mining claim is subject to relocation by any person authorized to locate mining claims; but if such relocation is not made then the acts necessary to constitute a valid location can be performed after the time limited by the statute of the State, and the same will relate back to the original location with like effect as if the same had been performed within the time limited by the statute, providing there has been no intervening claim or location. The apex means that part of the vein or lode found nearest the surface of the earth, and where it ceases to continue in the direction of the surface, and where it is first found in passing on its course downward into the earth. If you (the jury) find there exists within the boundaries of the Nest Egg lode claim, a vein, lode or ledge, the top, outcrop of apex of which is within said boundaries, and which, in its departure from a perpendicular on its downward course, enters into and underneath the boundaries of the Eureka claim, and located as a lode mining claim by plaintiff, then you will determine from the evidence which of these locations is the senior valid location, for the senior location on the dip of a lode is entitled to all such parts of said lode as are included within the side lines of the location as against a junior locator on outcrop, apex and strike of the same."—*Chicago Mining Review.*

ENGINEERING NOTES.

The Panama Canal.

Discouraging reports again come from the Isthmus, in regard to the Panama Canal. The New York *Times* of July 15th, says: "The trouble into which the panama Canal Company is drifting is shown by Commander Richier's reasons for resigning the agency of the company at the Isthmus. He struggled without success to prevent the fearful waste of funds with which the work was carried on; but that which excited his special indignation and caused his abrupt departure from the company's service was the reckless misrepresentations made regarding the progress of excavations. His repeated, pfotests were unheeded and he resigned, and refused to have anything more to do with the company on any terms. It is evident this huge project, blown up and sustained this long by the prestage of Ferdinand De Lesseps, is in danger of collapsing through utter loss of confidence in its management, and its prospects are very likely to prove the monumental failure of the age.

Lieut. Brown, of the U. S. Navy, has made a long and interesting report on the condition of the canal, under date of June 2, 1884. The original estimated cost was $125,000,000, and the time required for its completion was seven years. Nearly half of that time haa already elapsed, and as near as he can find out, not far short of $60,000,000 has been expended exclusive of the $20,000,000 expended for the Panama Railway. It is said that nearly all the material has been purchased at extravagant prices—that much of it is unusable—notably a number of exeavators, which, while anitable for the Suez sand, are unable to excavate the earth and rock of the Isthmus. Lientenant Brown waa informed by any intelligent person that material costing $15,000,000 had been allowed to sink into the marsh and was finally covered up. It is even said that some of the material has already been condemned and sold to vessels leaving Colon for ballast.

Forty-one hospitals have been constructed, costing over $3,000,000, and accommodating only about 400 patients, but their capacity will have to he increased if the work is vigorously prosecuted.

Lieutenant Brown considers the completion of the canal, accordiug to present plans, as very doubtful, as it will certainly require much more time and money than was originally estimated. He thinks that a canal with locks would be more feasable, but that its net profits would be much less.

A GREAT RAILROAD EVENT IN SOUTH AMERICA.—The great event of the past fortnight, says the Buenos Ayrea *Standard* of May 22d, has been the completion of the Andine Railway to Mendoza, capital of the province of that name and lying at the foot of the Andes. The importance of this great event can not be exaggerated; the line crosses the continent stretching from the Parana to the Cordillera. A zone of immense natural wealth is thus thrown open by this quick means of communication, and the traffic on the line promises to be very large. Mendoza is one of the richest provinces of the Republic; it covers an area of about 5,000 square leagues of land at the foot of the Andes, with a population estimated at 150,000 souls. The great drawback of the past—onerous and difficult means of communication—is now removed, and we may look forward to a great development of all the industries of the province. The mineral wealth of the province also is beyond calculation.

THE MERSEY TUNNEL.—The connection between the opposite ends of the railway tunnel under the Mersey, to connect Liverpool with Birkenhead, which was affected January 17th, is the consummation of one of the most important engineering works yet carried out in England. The tunnel under the Severn exceeds the Mersey Tunnel in length; but the latter is at present the longest roadway under a tidal river. The length of the Thames Tunnel is only 1,300 feet, whereas that of the Mersey Tunnel is nearly three times the length, or 3,690. It is expected that railway communication between Liverpool and Birkenhead will be established in about twelve months.

THE BRITISH CHANNEL TUNNEL PROJECT seems to have been at last temporarily abandoned since its defeat in the British house of commons by the decisive vote of 222 to 84. It will evidently be some time before locomotives with trains of cars will dive under the sea from the English coast and reappear on the shorea of France; hut the pertinacity shown in advocating the tunnel scheme may he successful in the end. The grounds of opposition on the part of the British government are regarded by other nations as most puerile.

CONNECTING THE BALTIC AND NORTH SEAS.—It seems that the idea of constructing the long-thought-of-canal which is to connect the Baltic and the North Sea has at length assumed definite shape. Bismarck has recousidered his former objections, and a hill for powers necessary to execnte the works will be laid before the Reichstag during the coming session. The cost of making the cntting through Holstein is estimated at between $30,000,000 and $35,000,000.

USEFUL INFORMATION.

Hand and Machine Made Putty.

How the two kinds are made, and the difference between them, is related by an old painter to the ubiquitous reporter as follows :

The best is made of raw linseed oil and whiting, the latter being simply chalk ground in a mill like flour. It comes out with a fine flint grit in it. Before making putty of it, a few old fashioned men, who believe in making the best of everything, wash the grit out. The fine flour is then dried. If it is not dried perfectly it takes up more oil than is desirable or profitable. From 500 to 600 pounds about 15 per cent, by weight, of raw oil to 85 per cent of whiting are put in a chaser and thoroughly mixed. The chaser is an annular trough, ten feet in diameter. From a vertical shaft in the center two arms extend, on the ends of which are heavy iron wheels that rest in the trough. When the shaft revolves the wheels chase each other around the trough. When mixed, it is packed in bladders for convenience in handling. The adulteration of putty is effected by mixing marble dust with whiting. It costs about a quarter of a cent a pound, and whiting costs twice that. Paraffine oils, at from 20 to 30 cents a gallon, are used instead of linseed oil at 60 cents. The marble dust makes the putty gritty, and the cheap oil makes it sticky. Cheap putty is decidedly cheap. Putty in bulk, wholesale, is worth $2 12 a hundred pounds. The other window glass cements run from $1 40 to $1 75. They are dear at that. They take longer to put on and longer to dry. Putty is neither imported nor exported. A lot was brought over a long time ago, but that was when oil was very high. The whitiug comes from England.

A superior article of putty is made, however, by the further addition of white lead in oil, japan varnish and a small quantity of turpeutine, which makea a hard cement that does not shrink, aud when dry can be rubbed down with pumice stone or dusted with sand paper, so smoothly will it cut. Even in the common sorts of putty it is well to use some white lead if a hard putty is desired.

Measuring Standing Grain.

An officer in the English navy has constructed a table for estimating, with all needful accuracy, the amount of wheat on an acre of land before it is harvested. The estimate can be made as soon as the grain is ripe. Make a wood or iron frame one yard square, carefully let it down over the standing grain, and then shell and weigh all the grain on the straws helonging inside the frame. If a circular "crop form," as he calls it, is more convenient, make it 6 feet 9¾ inches in diameter, of half-inch iron. From his elahorate table we extract the following:

2 oz. per sqr. yard equals 10.08 bu. per acre.
2½ oz. per sqr. yard equals 12.60 bu. per acre.
2⅔ oz. per sqr. yard equals 13.86 bu. per acre.
3 oz. per sqr. yard equals 15.12 bu. per acre.
3⅓ oz. per sqr. yard equals 17.65 bu. per acre.
4 oz. per sqr. yard equals 20.17 bu. per acre.
5 oz. per sqr. yard equals 25.21 bu. per acre.
5½ oz. per sqr. yard equals 29.00 bu. per acre.
6 oz. per sqr. yard equals 30.25 bu. per acre.
7 oz. per sqr. yard equals 35.29 bu. per acre.
8 oz. per sqr. yard equals 40.33 bu. per acre.

These estimates are on the basis of 60 pounds per bushel. The 2½ ounces to the square yard is about the average yield of wheat per acre in America; the 5½ ounces per sqnare yard is the average in Great Britain.

HOW ANNEALING MAKES METALS, ETC., PLIANT.—The anncaling of wire, glass and other substances renders them soft, more ductile and less brittle. A substance is annealed by simply heating it and allowing it to cool gradually. Recent experiments have resulted in the conclusion that the heating results in a kind of rupturing or cracking open; and in seeking an explanation of this, it is thought that in bringing the substance—take wire for illustration—suddenly to a white heat, the air held both physically and mechanically in the wire, is expanded and exploded, tearing its way out and leaving fissures and cracks all over the surface. These fissures are plainly visible and assume the torn and ragged appearance that might come from such explosions of the contained air. The wire, before stiff, is now soft and yielding, simply because it is cracked, and bends readily at every break on its surface. To illustrate this, we have only to paint a sheet of paper with a gum-like dextrine, or even mucilage; when the paper is stiffened, draw it over a sharp edge and crack the gum, and the paper will bend freely in every direction. Here the cracks are visible and it is easy to see that they allow the gum to bend. It may from this, be seen that annealing is a rupturing or cracking of the substance, and that its softness and pliability result from the free play given by the cracks.—*Manufacturer and Builder.*

VERTICAL FLIGHT OF BULLETS.—Experiments have been made in Hartford, Conn., with the vertical firing Gatling gun, in the presence of a number of mechanics, military men and others interested in gunnery. The inclination of the piece was determined hy a combined spirit level and quadrant. At an inclination of fifteen degrees, the time between the discharge and the return of the hullets into the river on the hanks of which the experiments were made, was fifty-nine seconds. On an exact vertical fire, the time of return was fifty-four seconds. The force of the return of the bullets—44 caliber rifle was sufficient to drive them through four inches of pine boards; enough to render any defenses not bomb proof untenable against such a shower.

AN ORIGINAL RAT TRAP.—An Illinois correspondent has been successful in catching rats with a trap of his own contrivance. This trap cosists of a sheet iron pipe with a sort of rim on both ends and a strong two-bushel sack tied firmly around one end. Every hole is stopped in the corn-crib but one, which opens into a feed box on the other side of the partition. Then the pipe is placed in the feed-box and fitted, the open end firmly over the hole, allowing the sack to hang over the edge of the box into the manger. The trap prepared, the door of the crib is left open and the rats permitted to have their own way for an hour or so. Then the door is shut and a noise made to frighten the rats. Having but one means of escape they rush into the pipe and down into the sack. This correspondent caught twenty-seven rats the first time he tried his trap.

ANCIENT SYSTEM OF WEIGHTS.—The most ancient system of weights in the Kingdom of England was the moneyer's pound, or the money pound of the Anglo-Saxons, which was continued in use for some centuries after the Conquest, being then known as the "Tower pound," or sometimes as the goldsmith's pound. It contained 12 ounces of 450 grains each, or 5,400 grains, and this weight of silver was a pound sterling. The Tower pound was abolished in 1527 by a statute of Henry VIII, which first established Troy weight as the only legal weight for gold and silver, and from that time to the present our system of coinage has been based on the Troy weight, the Troy pound containing 5,760 grains.

VEHICLES A HUNDRED YEARS AGO.—A lecturer on "London One Hundred Years Ago," says: "The four-wheeled vehicle, the aristocratic equipages, the hansom and the large, commodious 'bus of to-day were not then to be seen. In their place the wealthy rode or were conveyed on their trips or visits of pleasure to the theatre, the club, the gardens, the balls and routs of those days in the sedan chair, as is now the practice in China and other oriental countries. On each side of the sedan, borne by two stont men, ran the link-boys with lighted torches, flashing a glare of light as they ran on either sides of the narrow streets of London."

WATER-PROOF SHOES.—Boots and shoes may be rendered water proof by soaking them for several hours in thick, soapy water. The explanation is that the compound forms a fatty acid within the leather which then acquires the property of resisting the penetration of moisture.

GOOD HEALTH.

Indigestion.

Indigestion is the source of a multitude of diseases. In fact, disease necessarily follows long continued derangement of the digestive organs. The stomach is the laboratory in which the most wonderful chemical proccsses are constantly going on. Whatever is taken into the stomach is at once acted upon chemically, and the wholesome and nutritious portions go to build up and strengthen the system, while the effete matters are expelled through the various channels. Now when the food is crude and indigestible, or when good food is not properly masticated and mingled with the saliva before it enters the stomach, it lacks a very important element, and the digesting organs are subjected to great fatigue in efforts to prepare it for its work of sustaining life. When we consider the difficulties with which the stomach has to contend; of improper food forced into the stomach in a crude state and frequently in excess of the requirements of the body; of liquor drinking and tobacco using; the fact that three adult persons out of every four are of unsound health, and that the average term of human life is less than half what it should be under correct methods of living, should surprise no one.

There is not one person in ten who thinks of or seems to care for his health until he loses it.

The most absurd excuse for neglect of duty to oneself is, that he cannot always be looking after his health. In other words, he has not the moral power to abstain from excesscs that weaken the body and shorten life, as surely as night follows the day.

What a man eats and drinks habitually has much to do with the condition of mind and body.

The stomach is the fountain-head from whence the body draws its supplies. The old Roman idea of manliness was a "sound mind in a sound body." It is encouraging to know that the more intelligent of the present generation are adopting this view; and it is this class that is now paying the most attention to the laws of health. All colleges encourage today what they condemned twenty years ago; aa boat racing, hall playing, and regular systems of exercise. If an engineer were to load the safety-valve and build a fire under a steam boiler, and keep the fire replenished for a time without starting the engine, he would produce an explosion. If a man eats heartily, and leads an indolent life, a similar trouble occurs: his body is filled with the products of digestion; fat and fluids accumulate, and the muscles become soft and weak; more blood is made than the system requires, and the excess becomes a dangerous obstruction in the current of life, and the explosion may come in the form of apoplexy. The remedy is, to adapt the quality and the quantity of the food to the daily requirments of the body. Remember that labor, or active and sufficient exercise every day, is imperatively demanded if we expect to keep well. Let the food be plain but nutritious, and avoid rich pastry and other indigestible foods. Adjust the food supply to the bodily activities. —*Journal of Health.*

Hope as a Remedy Against Disease.

But little touched upon, hope as a remedy against disease is, if wisely and judiciously employed, one of the most valuable and useful means that the physician can employ. Call it what we may, and reason about it as we please, no man of experience will for an instant question that imagination, the prejudices, the mental condition, the conviction of the patient, in many cases, exerts a most powerful and most real influence upon the progress and termination of diseased conditions. Has it not happened to every one of our readers (it repeatedly has to us) to discover accidentally, so to speak, a condition of chronic disease, which has evidently been present for years, and yet the patient has maintained fairly good health, and is, at the time of the discovery, in no immediate apparent danger; yet when told that he is afflicted with an incurable disease that may carry him off in a few days, or that he may live for months, immediately wilts, like the sensitive plants when touched, and dies in a day or two?

Again, do we not all know of cases of chronic disease in persons with a happy, hopeful, contented disposition, disease that we felt sure would soon prove fatal? And yet we see them go on day after day and year aftey year enjoying apparently good health. Of course we are familiar with and thoroughly recognize the fact that worry, that mental anxiety, is diametrically opposed to good health and long life; and in this fact we recognize the explanation of the influence of depressing opinions and advice: for if we tell a man with a nervous temperament that he *may* die in a few days, from that moment all peace and contentment vanishes from his life, while anxiety, worry and unrest take possession of his whole being.

The practical point to be deduced from these reflections is, that it will redound not only to your patient's advantage, but also to your own professional reputation, to make it a rule always to take the most hopeful view that is possible of the patient's condition, especially when the man or woman is one the "nervous, worrying kind," and always to remember that "hope kept alive" is the great secret of success among quacks. Let us steal their thunder.—*Med. and Surg. Reporter.*

THE GROWTH OF HUMAN BEINGS.—The investigations of the Anthropometric Committee of the British Association, have made more or less clear, several interesting facts respecting the rate of growth of the two sexes. The period of most rapid growth is from birth to five years of age, and then both sexes grow alike, the girls being a little shorter and lighter than the boys. From five to ten the boys grow a little faster than the girls, but from ten to fifteen years the girls grow the faster, and at between eleven and a-half and fourteen and a half years old, are actually taller, and from twelve and a-half to fifteen and a-half are heavier than the boys. The boys, however, take the lead between fifteen and twenty years, and grow at first rapidly, but afterwards slower, and complete their growth at about twenty-three years, while girls grow very slowly after fifteen years of age, and attain their full stature at about the twentieth year. The tracings and tables show a slow but steady increase of stature up to the fiftieth year, and a more rapid increase in weight up to the sixtieth year in men, but the statistics of women are too few after the age of twenty three to determine the stature and weight of their sex at the more advanced periods of life. The fact that man continues to grow in stature up to his fiftieth year contradicts the popular notions on the subject according to which he ceases to grow before reaching half that age.

HOW TO KEEP THIN.—I found that the quantity or quality of what I ate made but little weight change, but on restricting the quantity I drank, the difference was soon apparent. I lost thirteen pounds in a fortnight, and was all the stronger and better for the loss. I took one cup of coffee for breakfast, half a pint of ale for dinner, and one cup of tea with that meal. In other respects, as to food and exercise, I lived as I had been accustomed to. I may add that I was not obese, nor did I imbibe immoderately, but wished to try the experiment for scientific purposes. — *Letter in London Standard.*

BORAX FOR HOARSENESS.—M. Corsón, in the *Journal de Pharmacie*, says that a piece of borax weighing two or three grains will, if allowed to dissolve slowly in the mouth of a singer, remove all trace of hoarseness.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SHUT DOWN.—Amador *Ledger*, July 19: The Zeile mill was brought to a standstill on Tuesday morning, in order to enable some repairs to be made to the chutes. It is expected to get in running order again by the end of the week. At the Grover men are hard at work repairing the damage done by the setting of the machinery. The third crew of contractors commenced sinking operations at the Mahoney last week; the second force having been compelled to surrender the job. About 20 feet has been sunk by the two lots of contractors, for which of course they get no pay. The rock is excessively hard, and even at the advanced rate under the second contract, the men were unable to make anything like wages. It is thought the work under the existing contract will proceed without any more delays. We learn that it is the intention of the Volcano Gold Gravel Mining Company to erect a large derrick at its mine to be operated on a Knight wheel. The company intended by this means to raise the gravel from below up to the level of the flume. A clean-up at the Motson mill, running on rock from the Lighthouse mine owned by W. E. Stewart and others, was made over a week ago, and realized between $5 and $6 per ton—a paying yield, as the ore can be easily mined.

SUTTER CREEK.—At the Lincoln everything remains at a standstill, awaiting the action of the Court in the pending suit. The Amador Consolidated mine looks rather discouraging, and has been so for some time. D. T. Davies and J. A. Steinberger arrived here last night, and it is probable their advent means some change in the situation. The ore-body that has supplied the mill of late is almost exhausted, and the mill will no doubt be stopped shortly. There is said to be rock in the old shaft, and hopes are entertained that the next move will be in that direction.

El Dorado.

GOOD QUARTZ.—*Mountain Democrat*, July 19: Superintendent H. H. McClellan, of the Melton mine, Grizzly Flat, showed us a sample of the ore now being taken out of tunnel number two. This rock will go $30 or $40 to the ton, and McClellan says there is plenty of it, though he does not pretend this is an average of all the ore he finds. The mine was never in better condition than at present, and indications are that the company will soon reap the reward they so richly deserve.

Inyo.

DEEP SPRINGS.—Inyo *Independent*, July 19: Teams are now hauling ore from Deep Springs to the Elna furnace. Mr. Minear, the Superintendent of the furnace, has hurried work as much as possible and is ready for a start. The ore now being delivered at the furnace belongs to S. P. Roberts, of Deep Springs. Quantities of ore from the same mine have been shipped to Oakland and sold there. Mr. Roberts was paid for some of it at the rate of 110 ounces silver and 60 per cent lead per ton. The lowest he was paid for any ore shipped by him from his claims at Deep Springs was 55 ounces silver and 50 per cent lead per ton. If the furnace at Elna shall prove successful in working these ores—and then is no known reason why it should not—the Deep Springs and old Pine Mountain districts can supply unlimited quantities. The railroad now gives facilities for carrying the ores to the furnace that materially lessens cost, and will thereby promote greater mining activity in that region than was ever before known.

BEVERIDGE MINES.—The mill at Beveridge, that has been stopped for some weeks, will be started up again about the beginning of August. The Keynote claim is that from which ore will be taken. The poorest ore ever taken from this claim yielded $58 per ton; much of it went over $200 per ton. The claim is owned by Lasky and Morena. Lately a small vein was opened in the mine, the ore from which is worth $2 per pound. The same parties have found a vein in the Vivarea claim that is fifteen inches wide, and contains over $200 per ton. Twenty-one tons of this ore are now on the dump, ready for milling.

BROWN MONSTER.—Messrs. Walter James and E. J. Reynolds have leased the Brown Monster mine from Mr. Eibeshutz. They will at once proceed to open up new ground in the mine, and expect soon to resume shipments of the rich lead ores that the mine produces. During the past twelve months the Brown Monster has produced some very rich smelting ores.

Mono.

BODIE CON.—Bodie *Free Press*, July 14: There was crushed during the past week 402 tons of ore. The pulp assay was $12.48, and of the failing $1.56 per ton. In the mine the south drift from upraise No. 3, 300-foot level, is in 38 feet.

BODIE TUNNEL.—Advance on the north drift, 200-foot level, twenty feet during past week.

THE NEW STANDARD MINE.—Bodie *Free Press*, July 16: The new Standard mine, situated on Bodie Hill west of the Standard Con., has attracted considerable attention in the six months past and will soon come to the front as a reliable property. There are several hundred tons of pay ore on the dump and prospecting has been pushed to the extent of 400 feet of drifts and tunnels. Louis Lewis, one of the owners, state that they are negotiating for a mill. Official letter of Monday states that during the week the south drift from the east crosscut on the Mono vein, 600-foot level, has been extended 22 feet, making the total length 132 feet. The north drift from same is in fifteen feet. The average assay from the vein in these drifts is $9.62. There are eleven men employed.

DRUM LUMMON BULLION.—Helena *Independent*: The Merchant's National Bank yesterday received nine large bars of bullion from the Drum Lummon mine valued at $21,000. The bars were the result of a ten days' run from the ten-stamp mill, the twenty-stamp mill having been closed down for ten days past, while being changed from dry to wet crushing. We understand the thirty stamps will be pounding away to-day. The above yield shows the ore that is now being worked to be very rich. The maximum crushing capacity of each stamp, as we understand it, is one and one-half tons in twenty-four hours—fifteen tons per day for all ten stamps, or 150 tons for the ten days' run, of which the above is the result. This demonstrates a value of $140 per ton saved in the mill, which, it is needless to say, is immense. The frame work and masonry for the new thirty stamps is about completed, and the stamps and other necessary machinery are upon the grounds, and it is expected will be running in four or five weeks, when the yield of gold and silver will pour in it a steady stream from this great mine—one of the richest and best in the world to-day.

CLIFTON.—Homer Mining *Index*, July 19: The winze from the tunnel in the Clifton mine is still in fine ore, with every indication that the fissure will continue to widen with depth, it being now fully six feet in width. As the ore of this mine is of the freest quality, easily reduced, and averages about $42.50 in gold to the ton, the width attained by the vein at a vertical dept of only about 60 feet renders it one of the most promising properties in the district—all the more so as it is more easily accessible and can be more economically worked than almost any other mine here. The Great Sierra tunnel in Tioga has not cut *into* the Sheepherder lode proper, but has passed through many quartz stringers, feeders to or outflows from the vein, some of these being several inches in thickness and carrying fine looking ore. When work was suspended the tunnel was in 1,784 feet—within just *one foot* of the vein, according to Carpenter's survey, and all the indications are that the header is within the eastern wall of the fissure. Work will not be resumed in the tunnel for some little time yet. August Cordes, the indefatigable prospector of Tioga, has resumed work on his New Brunswick claim on Mount Gibbs. He has, single-handed and alone, sunk a shaft to a depth of 35 feet, and as a reward for his industry has an ore vein over four feet in thickness (and how much more he does not know, as that is the diameter of his shaft) assaying from $13.50 to $181 per ton in silver, and $2.50 to $4 in gold. He will now explore the vein more fully by crosscuts from the bottom of the shaft. The prospects of Patterson District (Sweetwater in this county) are brightening. The Summers Con. is again shipping bullion, and has struck some very rich ore in a winze 100 feet below the 400-foot level. Sheriff C. F. McKinney has let a contract for a 100-foot tunnel to tap the same lode in his Homestake claim adjoining. The Silverado Company's mill will be ready to start up about the first of August. The Gorilla mine is improving steadily in quality of ore, especially on the lower levels. The reduction works and Planet mill were shut down for a few hours during the week, owing to an accident to the main water wheel, but both are now running and working admirably. The shipments of bullion are regular and increasing in quantity. A pack trail has been built up to the mines at the head of Callihan Creek, and work resumed on the Olsen claim, the recent rich discovery which bears such a striking resemblance to the old Standard mine of Bodie. The vein is now over four feet wide in the header of the tunnel, all good ore. William Irwin, for several years Superintendent of the Standard Con. in Bodie, has seven men at work in the Polita mine, near Bishop creek, and intends putting on another gang in a short time. He has from 600 to 800 tons of ore on the dump, which will be worked in the mill at Hawley. Everything about the May Lundy is running smoothly—mine, tramway, teams and mill—and the bullion shipments are regular and of about the same value as last season. Work is progressing as usual in the Bryant mine, and the breasts continue in high grade ore, of which from five to six tons per day is reduced in the Butterfield mill. The bullion shipments from this mine are now regular and large, considering the capacity of the mill. The Virginia Creek Hydraulic Company is using about 500 inches of water through a giant, and is running a heavy ground-sluice besides. The shipments of gold by this company are not reported, but are known to be heavy. The Mono mine in Bodie now employs but eleven men, thirty-five having been discharged during the week.

CONCENTRATOR FOR TEN MILE.—Professor J. G. Murphy, who returned a few days ago from New York, succeeded while East in perfecting arrangements for putting up concentrating works in the Ten Mile district. Professor Murphy has associated with himself Messrs. A. D. Churchill and Chas. G. Buchanan, of New York, and the firm name will be Murphy, Churchill & Buchanan. The works to be erected will be of fifty tons daily capacity to begin with. The machinery is now being constructed at the Union Foundry, Rockaway, New Jersey, and will be of the best in use. It will consist of high speed rolls, one set of 30-inch and one of 24-inch, for fine crushing, the Buchanan patent crusher; revolving screens for sizing; and Golden Gate concentrators, with power for a capacity of 100 tons daily, when it shall be found advisable to increase, the works to that capacity. The location of the concentrator will be at the mouth of Beaver creek where it empties into Ten Mile, opposite the Lee Mountain mines. The company will operate the Lee Mountain and the Latham groups of mines, and outside of the product of these will do custom work. They expect, we believe, to ultimately add smelters to their works. This will be the first move made toward providing the Ten Mile district with local works for the treatment of its ores, and with the encouragement which the miners up in that section will thus receive it will not be long until the Ten Mile mines begin to show up their richness.

Plumas.

GREEN MOUNTAIN.—Greenville *Bulletin*, July 16: On Tuesday morning the Green Mountain Co. started the last 30 stamps, and the whole mine is now running smoothly and well. No. 2 raise has connected with No. 2 blind drift east, and stopes are started above No. 2 drift. The face of No. 2 is very hard, and the company have been running burleigh drills since the 19th ult. The drift is now in about 110 ft and will be continued as rapidly as possible until the east line of chute is reached, a distance of about 90 ft. No. 6 drift east from No. 1 raise is now in 80 ft, and the ground is favorable for good progress, and shows a fine face of good pay quartz. A raise will soon be started to connect with winze sunk from No. 5 tunnel, which will give a large quantity of good ore and facilitate handling of timbers for this part of the workings. Tracks are being laid on the blind drifts and chutes being put in and stopes opened. The company will soon be in shape to handle the ore broken, economically and quickly. As work progresses at the Whiting mine, in French ravine, the quality of the rock improves, we are informed. Ten tons of ore from the Hallstead mine were crushed in an arastra, yielding $30 per ton. The second ten tons yielded $60 per ton. Work on the mill, to be erected at the Lucky S mine, will begin immediately. Messrs. Hardgrave, Hosselkus and Thompson have made arrangements whereby the work will be prosecuted vigorously. Col. Raymond, who has been here for several weeks past, will start to San Francisco to-morrow. He is a mining man of considerable experience, and he has been looking at several of the mines here. He has a very favorable opinion of this part of the country, and thinks it one of the best mining sections in the State. He expects to return in a couple of months.

THE HALLSTED.—Plumas *National*, July 16: Kingsbury's Ferry located the large hydraulic claims which Mr. A. D. Hallsted had been working for several years, and a glance over the ground shows that although much gravel has been removed, only a start has been made, and a mountain of "pay-grit" yet remains to be worked. The water for this claim is bought from Mill Creek, and piped across the East Branch, the large iron pipe being about twenty-four hundred feet in length. The Hallsted quartz mine is on Rich Gulch, and nearly four miles from the Ferry. One run of several tons recently made, yielded $35 per ton, and another run panned out over $60 to the ton. Of course the rock is carefully selected, as it would be slow business to work low grade ore in the primitive style in which they are obliged to work at present. The ore is brought from the top of the mountains, nearly a mile away, with a train of five jackasses. The tunnel is 300 feet in length, and taps the ledge at a depth of 250 feet. At the point of intersection the vein is hard, but the drift to the east soon shows it better, and the improvement is marked every foot of the way for 130 feet, the last 40 feet showing a magnificent chimney, at least 16 feet wide between the walls, all fine looking ore. Parallel with the hanging wall is a vein of three or four feet in width, filled with iron cubes, and decomposed, which prospects splendidly. Taken out by itself this rock should pay $15 or $20 per ton. The vein shows gold in good prospects clear across and should pay an average of $7 or $8 for the entire width. The face of the drifts shows fully as well or better than any part of it, and the body of quartz exposed is simply enormous. The west drift from the tunnel does not look so favorably, being in a hard, blue quartz, filled with bright sulphurets. After taking a look through these tunnels we climb to the upper works, where the rock for the arasta is being mined at present. Here are several openings, all showing the ledge strong, and all showing by prospects that the ore carries plenty of gold for good milling rock. It is nearly certain that this quartz mine furnished the gold that made Rich Gulch famous in olden times, as the work shows that the pay stopped as soon as the ledge was crossed. Taken all in all it is a grand outlook, and with the necessary capital would make the "big mine" of Northern California. It is splendidly located, can be opened by tunnels at a depth of 12,000 feet, is large enough to furnish rock for any quantity of stamps, has good timber in endless quantity, and water can be brought to furnish all the power which will ever be needed.

Sierra.

JEROME YORK'S BONANZA.—Sierra *Tribune*, July 19: Jerome York made another clean-up at his mine in Slug Canyon Tuesday which resulted in giving him the very handsome sum of $750 from eight weeks run with the arastra. For three weeks of that time, owing to the scarcity of water, the arastra did not crush to exceed one ton of ore per day. During the last run, as heretofore, Jerome has only employed one man. Where he is now working the vein varies from one to nine feet in width and everything taken out from between the walls is crushed. Quite recently ran into the hill 140 ft perpendicularly below the present workings and encountered the ledge. At the new point it measures four and a half feet in width and prospects equally as well, if not better than above.

W. H. WELDON'S MINING ENTERPRISE.—At the Gold King quartz mine below Alleghany two shifts of men are engaged in driving ahead the new tunnel, which is now in 100 feet. The rock is very hard and consequently slow progress is made. Mr. Weldon is now arranging to put in a drill manufactured by the California Rock Drill Company, of San Francisco. The new drill will be worked by water power and it is calculated that with its use the tunnel can be run at a very great saving of time and money over the ordinary hand method. The drill referred to has been successfully operated with in other mining sections, but this will be the first one to have been tried in this county. Many mine owners hereabouts will watch the trial of the new drill with interest.

MARGUERITE.—The *Tribune* reporter found every-thing astir at the Marguerite mine. Four hundred feet west of the present shaft they are engaged in grading a site for the new hoisting works. A three-compartment shaft is also being sunk at this point. In addition to sinking from the surface the work is being hurried up by raising from the third and second levels. It is expected to make the connections in about ten days. As soon as the new shaft is completed the hoisting machinery will be removed there and the old works abandoned. The new pumps work well and the work of opening out the level is going rapidly ahead. The outlook of this mine was never more favorable than it is at the present time.

A GOOD SHOWING.—Last week a *Tribune* reporter visited the Hope quartz mine at Minnesota and was pleased in finding a very flattering state of affairs there. G. V. Williams has charge of the mine and under his experienced management the work of development is going steadily forward. In addition to other work a winze has been sunk 37 feet in the face of the main tunnel and a drift run ten feet east and one sixteen feet west. Splendid prospects have been obtained in that quarter. Sufficient gold has been taken from the ledge during the past month to pay all working expenses.

THE ALASKA MINE.—At the Alaska mine, Pike City, Superintendent Davis is pushing work along rapidly. Two new boilers have been placed in the hoisting works. A new Hooker pump, with a pumping capacity of one million gallons of water in 24 hours, arrived at the mine last Sunday and will be planted at No. 3 station immediately. With the new machinery, there is no liability of any further difficulty in handling the water. It is expected to start the mill up early next month.

NEARING THE LEDGE.—The Rainbow tunnel is now in over 1500 feet further. Last week stringers of quartz were encountered and also soft rock, rendering it necessary to timber the tunnel. The course of the tunnel was recently altered and is now bearing more to the east. Around Alleghany there is a very hopeful feeling regarding the future of the Rainbow mine, and the people anticipate lively times for that camp when the lower workings of the mine are properly developed.

San Bernardino.

KING MINE MILL IMPROVEMENTS.—Calico *Print*, July 19: The King Mining Co. are making long needed improvements at the Oriental Mill. As soon as poles can be shipped from Flagstaff a telephone will be built from the mill to the mine at Calico and possibly from the mill to Daggett. The improvements at the mill will be the laying of a pipe from the station to the mill for the transporting of the oil used by the furnace and the erection of a new engine for the purpose of running turning-lathes and other implements necessary for repairing mill and other kinds of machinery. When these improvements are finished the Oriental will be the best equipped mill in the country.

San Diego.

PINACATE DISTRICT.—Colton *Semi-Tropic*, July 16: Arrangements are now all completed to start up the San Jacinto Company's mill now to work on custom ore, of which there is in the near neighborhood 200 tons ready to be crushed. The hauling of ore to the mill will commence early next week. A number of experienced workmen having been sent for to assist in operating the mill. Hon. John Lawshe, the principal owner of the San Jacinto mine, will soon have a large force at work taking out ore from the mine, and there is unusual activity among the owners of other mines in getting out ore to be crushed at the mill. During the week a sale of the Santa Fe mine, in Gavalan district, was effected. The purchasers of the Santa Fe mine are Eastern men of large capital and are well pleased with their bargain, and will immediately proceed to erect a large mill and work the mine for all it is worth. The Santa Fe mine has been worked for a long time by Mexicans, who crushed the ore taken out with splendid results. In the Menifree district we learn that the plant for a large 40-stamp quartz mill has been ordered and, that the Menifree Mining Company are making extensive preparations to develop up their mines. For the present the Menifree ore will be crushed at the San Jacinto mill. We hear that negotiations are now going on for the transfer of valuable mining interests in the districts named.

Tuolumne.

HUNTER.—*Union Democrat*, July 19: The Hunter mine, situated near the Buchanan mine, which was bought by an Eastern company some two or three years ago was sold at Sheriff's sale in January on labor liens to Josiah Phillips and others, lienholders. The time of redemption expiring they received a deed for the property Monday. Phillips has worked the mine the past four months with good success. He represents to be now working the mine and running a ten stamp mill, crushing about thirteen tons of ore daily. In the mine there is a vein two and a half feet in width and for a distance of fifty feet, far as tested, pays from $18 to $20 per ton. From this it looks very much as if the Eastern Company let go its hold too soon from a very valuable property.

NEVADA.

Washoe District.

MEXICAN.—Virginia *Enterprise*, July 16: The winze on the 3200 level, which is being sunk jointly with the Ophir, Sierra and Nevada and Union Consolidated companies, is now making fair progress. Heretofore the rock has not blasted well. It was a kind of bastard quartz, which had to be almost burned out with powder, so little could be thrown out by the blasts. Now, however, some porphyry is coming in, and the rock as a whole breaks out much better. During the past week the winze has been sunk and timbered about 8 feet. There is no trouble on account of water.

UNION CONSOLIDATED.—The only work being done at present is jointly with the Ophir, Sierra Nevada and Mexican, on the 3200 level of that company, in the winze which is designed to explore the north end of the Comstock to the depth of 3300 feet or more. Work in this winze is progressing steadily.

CHOLLAR.—The bulkhead on the 2600 level has been completed, and the valve of the same was closed last Sunday afternoon. The main south drift on this level is being advanced at the rate of about 50 feet per week. The formation is vein porphyry, with some thin streaks of clay and occasional stringers of quartz. From this drift crosscuts will presently be run at proper intervals. The pumps, and all the machinery at the Combination shaft, are running well and smoothly.

GOULD AND CURRY.—The joint Best and Belcher drift southwest on the 2500 level is making good progress in a mixture of soft porphyry and clay, with streaks of quartz of a favorable appearance. A station will be soon opened at the 825 level in the Bonner shaft, and a drift run to the northward, which drift will eventually be connected with the joint west drift of the Best and Belcher and Consolidated Virginia by means of an upraise.

BEST AND BELCHER.—Good headway is making in the joint Gould and Curry southwest drift on the 2500 level. It is in ground of a favorable appearance, being vein porphyry with streaks of clay and stringers of quartz. The joint Consolidated Virginia west drift, on the 1200 level, is being advanced at the rate of 25 feet per week, in a favorable formation of vein porphyry, clay and quartz.

ALTA.—The diamond drill is being run west from the face of the west drift on the 2150 level, and is out some 500 feet. It shows no water in that direction to interfere with drifting. Work has not yet been resumed in the east drift on the 2150 level. There is known to be a considerable quantity of water in that direction, which must be drained off in running exploring drifts into the east ground.

OPHIR.—The new west drift on the 500 level is out about 20 feet. It is in ground that blasts very well. Some ore is still being obtained on the 250 level by taking out and assorting the filling of the old drifts.

HALE AND NORCROSS.—From the 200 level there are being extracted between 400 and 500 tons of ore per week, all of which is brought out through the I street tunnel. Work has not yet been resumed on the 2800 level, at which point there is known to be a considerable amount of good ore.

YELLOW JACKET.—The old upper levels are still yielding well in low-grade ore, which is being worked in the mills on the Carson river. The exploring drifts are finding more or less ore, giving assurance of a supply sufficient to keep the mills going for many months to come.

CONSOLIDATED VIRGINIA.—Water having made its appearance in the main south drift on the 2900 level, the diamond drill has been put into the face and is being sent ahead to explore the ground, which gives signs of being very wet.

ANDES.—The north drift along the hanging wall is in a streak of quartz of good quality, which yields some paying ore. The bottom of the winze continues in porphyry, with some stringers of quartz.

SIERRA NEVADA. Work has been commenced on west crosscut No. 4, but has not yet progressed so far as to show rock very different from that found in the main north drift. The ground is dry and blasts very well.

ALPHA CONSOLIDATED.—Good progress is making in the north drift, and much quartz of a very favorable appearance is being encountered.

CROWN POINT.—The mine is yielding the usual quantity and quality of ore, keeping the mills on the Carson river in constant operation.

Columbus District.

THE WEEK'S OPERATIONS.—Candelaria *True Fissure*, July 16: The east drift from winze No. 5 shows a small amount of ore. At the raise from the east drift on the third level, a strong ledge has been developed, but it is a good deal mixed with waste. The west drift from the north crosscut, on the third level, is in 24 feet, and shows a little ore. The west intermediate, between the first and second levels, is in 112 feet, and shows some $40 quartz that looks promising. The east drift on the first level is giving some $60 ore from an irregular ledge. A small amount of ore is being taken from the west drift on the first level. During the week about 300 feet of track has been put in on the fourth level, and the work of extending the west drift has been begun. The face of this drift shows some $60 quartz. The incline has been sunk 15 feet during the week, and is now 209 feet below the third level.

Peavine District.

STRUCK THE LEAD.—Reno *Journal*, July 16: Capt. Griffith brought in from Peavine a large sample of the ore recently encountered in the Poe ledge. He started a tunnel last fall and has run in 475 feet. Last Saturday night the miners cut into the ledge which they have been expecting to strike at every blast for the past fifty feet. They have gone into the ore about four feet. It is a solid mass of black sulphurets ore, such as gave the mine its reputation in early days, and is very much like the rich ore found in the Pyramid mines. It will run from 40 to 60 per cent. in copper, and is rich in gold and silver. It is exactly what the Captain expected to find, and he is, naturally enough, very much elated. The tunnel cuts the ledge 225 feet below the surface.

White Pine District.

MINING OUTLOOK.—White Pine *News*, June 16: The "Chief" a new discovery on Treasure Hill, on the trail leading from Hamilton, is the property of James Reilly, and is now being developed by him. It is said to show up well in average grade ore—say $50 to $70—and there is a large quantity in sight. While it will not pay for shipping, it can be worked to a handsome profit in the camp. Mr. Jack Gilmer and his experts were over examining it the other day, and they were well pleased with its prospects. They may purchase the property, but whether they do or not, Mr. Reilly will continue developments as long as the prospects are so favorable.

THE SWEETWATER.—With the exception of a few men working in the Wheeler tunnel, this company is doing nothing at present. Mr. Robinson, its managing director, is in New York, endeavoring to raise funds to erect leaching works and start in on that process. He was to have returned several weeks ago, but now his return is not definitely set. The company has some valuable property, but they have never raised means enough to start in to develop it in a way that was sure to put it on a permanent paying basis.

THE JENNIE A.—Is said to be looking encouraging. Developments are being pushed, and the results are very encouraging. This company contemplate running a furnace this summer. Their showing is perhaps the best in White Pine.

EBERHARDT.—Bros. Townshend and Hayes took us down to the once lively, but now almost deserted town of Eberhardt. Like Goldsmith's "Deserted Village" its glory seems to have departed. Oliver Drake, at the company's office, was the only man we met in the place. From thence we went up into the tunnel, where we found Capt. Drake and his machinist, J. L. Robertson, very busy repairing some machinery that had gotten out of order. The Captain was putting in hard licks. To our inquiry about the prospects in the tunnel, the Captain smiled and said they had "nothing big." He showed us samples of ore he had been encountering in small bunches for some time. It looked fair, a little base and altogether different from that found in the upper working. The Captain told us the situation in the tunnel was such as to encourage him and his company to go on prospecting but nothing more.

TYBO.—Eureka *Sentinel*, July 16: M. Brougher returned yesterday from a trip to Tybo since the fire. He says the little old camp looks about as bad as possible, literally in ashes. The people hardly know what to do, whether to build up or not, for the camp is by no means lively. Mr. Trowbridge says the loss of the company by the burning of its branch store was put in too high, as he succeeded in saving some $2,000 worth of goods from the flames. The company's mill will start up Monday. The mine is looking first-rate, and there are 1,500 tons of ore on the dump to be reduced.

Santa Fe District.

RICH ROCK.—Walker Lake *Bulletin*, July 16: Some very rich rock has been struck in the Confidence mine, near the Stone Cabin, in Santa Fe. The tunnel is in 150 feet, and is being pushed very fast. Mr. Smith, of Candelaria, has two men at work on his mine.

Gillis Mountain District.

ORE.—Walker Lake *Bulletin*, July 16. Benton and Kennedy are getting their mine, in Gillis Mountain, in good shape, and will soon make a shipment, as they have a fine lot of ore in the dump.

Taylor District.

MEN.—Cor. Eureka *Sentinel*, July 15: There are a great many strangers in our midst, and about as many men as the companies need to do their work. I would advise no one to come here hunting work. Our principal mines—the Monitor and Argus—are looking well and turning out their usual quantity and quality of ore. Considerable prospecting is going on around our camp.

Bullion District.

OPENING A MINE.—*Silver State*, July 16: C. H. Egbert, who has been here for some time, left last week for Bullion District, east of Lewis, to take charge of the Lady of the Lake mine, which has been incorporated, and which the company has concluded to develop.

ARIZONA.

TIPTOP DISTRICT. Cor. Phœnix *Herald*, July 12: The Basin mining camps are in the Tiptop district, lying, on a bee line, one and a half miles from Humbug, on the same lode, some of the veins being located the entire distance. The Basin is on the east side of the ridge and rich in silver; Humbug is on the west side and rich in gold. The miners in Basin endeavor to make the properties pay as they are being developed. A few consignments to San Francisco paid, and some ore worked at Gillett paid a dividend, but the chloriders were unable to keep out of debt until they commenced shipping ore to Benson. I was surprised at the thrift and extent of these mines, almost unknown to the outside world. The chloriders handle no ore that pays less than $100 per ton. Mr. H. W. Coulsen has been chloriding for seven years and never made it pay till he commenced to ship to Benson. Mr. Coulsen has more or less developed several claims. On the Silver Hatchet he has two shafts connected with a tunnel that show a 10-inch vein of $50 ore. He has two claims on the Crescent lode, one of which has a 112-foot shaft that has yielded about $18,000 worth of high-grade ore by selecting the best, but the 5-foot vein averages about $40 per ton. The other claim he calls the Comet, and from an 80-foot shaft on a 20-inch vein he selects ore that sells in Benson for $400 per ton. The Crescent lode runs north and south through the district cutting at right angles all the other lodes, which run east and west. James Hasner has a good showing on a claim near Coulsen's. He has tunneled the mountain for 60 ft along the vein and raised to the surface with a shaft. He has ready for shipment about 10 tons of $400 ore. The old Barnum mine is yielding high-grade ore, and the Swilling mine has good prospects. It is generally conceded, however, that the Smithline brothers have the boss mine of the district, so far as present developments have shown. They have a tunnel run into the hill 65 ft along the lode, at the end of which a 05-foot shaft penetrates high-grade ore for 30 ft. The ore from this shaft brought them $5,500. From the bottom of the shaft they have tunneled the vein under the above tunnel in high-grade ore for 140 ft. The lower tunnel filled with water last winter and remains so. They then commenced a perpendicular shaft to strike the lode across a ravine and went down 77 ft and it is yet dry. From the bottom of the shaft they run a 20-foot tunnel back along a 5-inch vein of bullion, on which the eagle's wings are already sprouting, for some of it will go $20,000 to the ton. About 110 ft more will connect the two tunnels, and machinery will be erected for reducing the water preparatory to stoping. Here are five mines that look better than the Tiptop did at the same stage of development, while it never equaled the Smithline mine. Another valuable mine belonging to Jo Meyer and several others is lying idle because the partners disagree. The pleasing feature of the camp is that the owners are practical miners that are making the mines pay their way without any uncertain investment.

Jackrabbit District.

DAY FURNACE.—*Pioche Record*, July 16: At Bristol the furnace was not in shape to run till Tuesday, when it was started up at noon, with twelve-hour shifts. The furnace is run at much less expense than heretofore, and the company saves about $16 per day, or $480 per month. The new hands from Utah desired to work 12-hour shifts, so the smelters now get $5 per day in place of $4, and the helpers $4 in place of $3½. It is thus seen that the helpers get one-bit for each extra hour's work, or four-bits for the four extra hours, while the smelters get two-bits for each extra hour, or $1 for the four extra hours. This is big pay to Utah men.

Esmeralda District

AURORA REVIVING.—Walker Lake *Bulletin*, July 14: Several of the mines at old Aurora are now doing well, and the citizens are jubilant over the prospect of the resumption of the old time activity. Judge Seawell and John Neidy are working the New Esmeraldo to advantage. A short time since a working sample of their ore was milled, and the result assures a profitabe result to their enterprise. The Silver Lining, the Poor mine and others are also doing well, and, while not making much noise, Aurora is getting ready to stand near the head of the list of bullion producers.

Palmetto District.

MINING INTERESTS.—Virginia *Enterprise*, July 17: Guy Thorpe has arrived at Carson from Palmetto District, and speaks well of his mining interests at that place.

Patterson District.

GOOD INDICATIONS.—Eureka *Sentinel*, July 14: We had a talk with C. M. Thaxton, of Hamilton, in regard to Patterson District, which is situated in Lincoln county, east of the road to Bristol, and is reached by a turn off some seven or eight miles south of Parker's Station. In the lively days of Pioche Judge Flowers, an old-time miner with a world of experience, left the excited camp on a prospecting tour and found flattering indications in Patterson. The district was worked, off and on, after that time, but had been abandoned for a great many years, when last fall, Judge Flowers took a trip over there. He tried some croppings, and with a single blast uncovered a body of very rich ore. Some work was done on the extensive croppings, but the bad weather of last winter and spring hindered extensive developments. Down to a depth of forty feet the indications were that the Matthewson Brothers, Judge Flowers and General Coulter were going to have another Eberhart; but there a porphyry "horse" came in, and the ledge, which is between porphyry and lime, threatened to pinch out entirely. On going through the "horse," however, the ledge was found again at once and the hopes of the owners of the property are now stronger than ever. The ore, which is generally chloride of silver in the places, is very rich and holds steadily between $200 and $800, some of it going, however, high up into the thousands, and other ore, but little of it, falling down to $120. A considerable quantity of this precious stuff is sacked up at the mine, and negotiations are going to have it reduced at Bristol or to ship it on to Salt Lake for reduction. Some of it is free milling and some roasting ore. It is so rich that it would pay handsomely for shipment even to Swansea. There are five or six men at work taking out and sacking ore, the value of which is determined regularly by assay. It is being piled up and definitely labeled, so to speak, with its coin value. The men employed in the mine were engaged to work for $2 a day and grub furnished, with the further agreement that if the yield of the mine went beyond a certain income fixed upon by the owners, the pay of the miners should be increased in proportion. On these terms the men have been, and are, making, above expenses, from $5 to $6 per day each. How extensive the property will turn out to be is bare speculation, but hopes are entertained that it will become a large, permanent, paying mine.

ORE SHIPMENTS.—Prescott *Courier*, July 16: Mr. Cox reached Prescott yesterday morning from the Dosoris mine. He reports regular shipments of ore, and that the ledge in the Buzzard mine, at a depth of 100 feet from the surface, is fully three feet wide. Mr. Dawes, day before yesterday, made a large shipment of quicksilver to Mr. Chase, of Pine Flat, whose mill will soon be running on gold rock. The Bueno mill and concentrators are treating ore from the Holmes mine. Concentrators will be shipped to Eastern reduction works. A citizen who came recently from Jerome tells us that the 30 ton smelter (Fraser & Chalmer's make) is running out a great deal of copper-silver bullion, and that Superintendent Thomas is shipping his richest ore to the East. There are, in sight, immense bodies of ore, a sight of which will satisfy any mining man that United Verde is one of the greatest mining properties in the world. It is proposed to start the Kimball mill Thursday next. All are in hopes that it will be a success. More attention will hereafter be paid to places where placer gold exists. The Crook and several other gold mines in Hassayampa district, twelve miles south of Prescott, carry very rich rock. The White Spar mine is showing up well. Turkey creek mines please all practical and scientific men who have examined them and are certain to pay well. There is a rumor to the effect that the Howell reduction works will be started up about the first of next month. The Middleton mine, near the head of Lynx creek, is favorably mentioned by experts.

GROOM CREEK.—C. H. Aaron, the well-known assayer and metallurgist, has just returned from Groom creek district, six miles south of Prescott, and tells us that his observations there strengthen him in the belief that it will soon become a thrifty camp. The ledges (no top) carry gold; but, as depth is attained, silver is the metal. Mr. Clerk has let a contract for the extraction of ore; put his mill in better fix to save the precious metals, and will, very soon, take a fresh start.

COLORADO.

CASCADE DISTRICT.—Georgetown *Courier*, July 17: A number of prospects are being worked and a spirit of activity is noticeable. Good ore is being produced, and the properties of the section are being quite extensively developed. The Eclipse mine is working its usual force of men—about fourteen—with good results. Considerable gray copper is found scattered through the quartz in the Silver Link adit, which is being driven ahead. Lessees are crosscutting from the 150-foot level of the Charter Oak lode to reach the hanging wall. The Cascade is being worked by lessees. A recent shipment of 48 sacks of ore milled 127 ounces silver per ton in one class. Pat Hefferner is developing his Gray Copper lode on Chicago creek, and is doing well. A crosscut is being driven for the lode. The Gow brothers are working the Denver View lode, at the head of Cascade creek, and are taking out some good mineral.

NOTES.—Three carloads of ore from the Joe Reynolds were shipped yesterday. A large body of ore, carrying gray copper and ruby silver, is exposed in the Fulton lode. About $4,000 was taken out of a shaft on the Fred Rogers lode, in sinking a depth of 30 ft. A good streak of ore is shown in the Watts lode, Brown mountain, which runs over $500 per ton. Considerable gray copper and sulphuret ore has been encountered in the Detroit lode, Kelso mountain. We learn extensive developments will be made on the Backbone mine as soon as it is free from water. The mine is producing some good mineral. A new car and track is being placed in the tunnel of the Monarch lode, in Daily district, and an ore house and blacksmith shop is being erected. It is reported that there are two levels on the Black lode, in Cascade district, in which the pay streak is continuous for 50 ft, averaging about three inches in width. Reed & McGrath's recent strike on the Chelsea Beach lode is turning out well. They have a good streak of mineral, assays from which run as high as 1,700 ounces silver. Mr. George Cox let two leases on the Bismarck mine last week. One is for 300 ft on level No. 3, and the other to sink 125 ft from the same level, and to run 500 ft. Summit county is excited over a recent rich gold find in Gibson gulch, near Breckenridge. The dirt is reported as giving from 50 cents to $3 per pan. Two citizens of Dumont recently struck a 16-inch streak of galena ore which is scattered through quartz at the grass roots. They have christened the find the Rustic. Twenty tons of ore were shipped from the Stevens mine on last Saturday. A mill-run of 22 tons was also had from this mine recently, which returned 130 ounces silver and 50 per cent lead. The first shipment of ore from over the range was made a few days ago by Wilson & Webb, from a mine at Williams Fork. There were 400 sacks of ore, which milled an average of 125 ounces silver per ton. Wood & Welch, lessees on the White, have a good streak of mineral. They are drifting and stoping. Potter & Co. are reported to have a streak of ore over 20 inches wide, which mills from $80 to $150 per ton. In the bottom of the shaft upon the Big Horn lode, near Dumont, a good strike was made on Saturday last. The character of the ore is copper, galena and silver glance, and assays 2,700 ounces silver to the ton.

IDAHO.

EAST FORK OF SALMON.—Ketchum *Keystone*, July 15: Persons just in from Germania Basin on East Fork of Salmon, give us the following items of interest concerning mining operations in that new district. The Idaho, Bibleback and San Doorne mines have been worked on leases since late last fall by light forces, and have shipped among them sixty tons of first-class lead ore to the Clayton smelters. The ores of these claims is entirely lead and iron oxides of lead very similar in character to the ores of Lower Wood River. Until within the past six months they were worked entirely at Bayhorse, but now find a better profit in reduction at the Clayton works on the Salmon, sixteen miles south of Bayhorse. The Germania began mining for ore two weeks since, and will employ a small force during the present working season. The Germania is the celebrated claim that first drew attention to that promising region, and from which the surrounding country took its name. Seven tons of good ore has been extracted from a new claim known as the "Fraction" in Germania Basin, which promises to be one of the finest properties in the region. The mining outlook of this section of Idaho is indeed flattering, and is at present suffering nothing of the inactivity that besets other equally as prominent localities. The miners of Germania Basin have the correct idea of developing their possessions, and in patronizing the Clayton smelters are keeping up quite a current of life between the two points.

MONTANA.

ANACONDA.—*Inter-Mountain*, July 15: The concentrator and smelter are now in an advanced state of completion. The concentrator will have a daily capacity of 500 tons, and the furnaces of the smelter will be fully able to treat the product. The ore will be dressed by jigger process, and such is the location and arrangement of the works that water power and the force of gravitation will prove readily capable of handling every pound of ore from the time it leaves the rollers in the concentrator until it is turned out as matte in marketable form by the furnaces. The saving thus affected in machinery, fuel and labor will be immense. The system and clock-work regularity, with which the construction of the vast enterprise is managed, and the labor of the army of employees is directed excite the wonder and challenge the admiration of all. It is stated that nearly $800,000 have thus far been expended on the works, but despite this vast outlay of money, there has been no waste, no extravagance. Every man employed does his full day's work, and scarcely a nail is allowed to be thrown away. A thousand hammers and saws are at work on the mighty structure, and Babel was a quiet place in comparison, but the idea is to do as much work as possible within the next thirty days, and then only the finishing touches will need to be applied. The smelter, a structure over 500 feet in length, and so wide that the 60-stamp mill of the Alice could be stowed in one end of it.

OREGON.

CLEANING UP.—Jacksonville *Times*, July 12: The Sterling Mining Co. is cleaning up. Walter Simmons, of Galice creek, is making a fine clean-up. He has taken out $3,000 as far as known. Work has been suspended at Sturgis' drifting diggings on Forest creek, owing to the scarcity of water. Green Bros., of Galice creek, have run their tunnel 100 feet, and expect to strike the ledge before long. The Cœur d'Alene excitement is slowly dying out. W. T. Clemons has returned to Galice creek, where he will engage in prospecting. He has been in charge of the English Co.'s mines in that district. Mr. Arnott, who is mining the bed of Galice creek, is taking out an ounce a day. He has averaged half an ounce per diem ever since he commenced this season. Jas. Maloney has taken charge of the Steam Beer mines in the Grave creek district, which are owned by Thos. Criteser and other Roseburg parties. They will be put in good shape for next season's work. There is quite an excitement over the discovery of quartz on the Santiam river in Linn county, and several claims have been located. A mill is being put on the site of the discovery, which is said to be rich. Our Rock Point correspondent says: J. H. Pomeroy and C. W. Burrage, the owners of the extensive iron beds four miles above Rock Point, arrived there a few days since, and will commence developing their mines early next week.

UTAH.

REVIEW.—Salt Lake *Tribune*, July 16: The week has been distinguished by showery weather—something altogether unusual for this Territory in July; and which has not tended to the betterment of the canyon roads. The receipts of bullion in this city for the week ending July 16th, inclusive, amounted to $111,844 43; no ore. For the previous week, the receipts were $131,855.53 in bullion, and $3,800 in ore. The shipments of the Horn Silver for the week were nineteen bars of bullion, $57,000; total for the year 1884 to date, $1,277,000. The receipts from the Ontario for the week aforesaid, were fifty-six bars, $43,304.43; bringing the total product for the current year up to $870,853.80. The product of the Hanauer smelter for the week was two cars of bullion, $4,000. The Stormont sent up during the week, two bars of silver, $3,540. And there was received $4,000 in bullion from Nevada. The week was rather a quiet one, and the difficulty of getting full supplies of ores from the hills has told on the product of the smelters.

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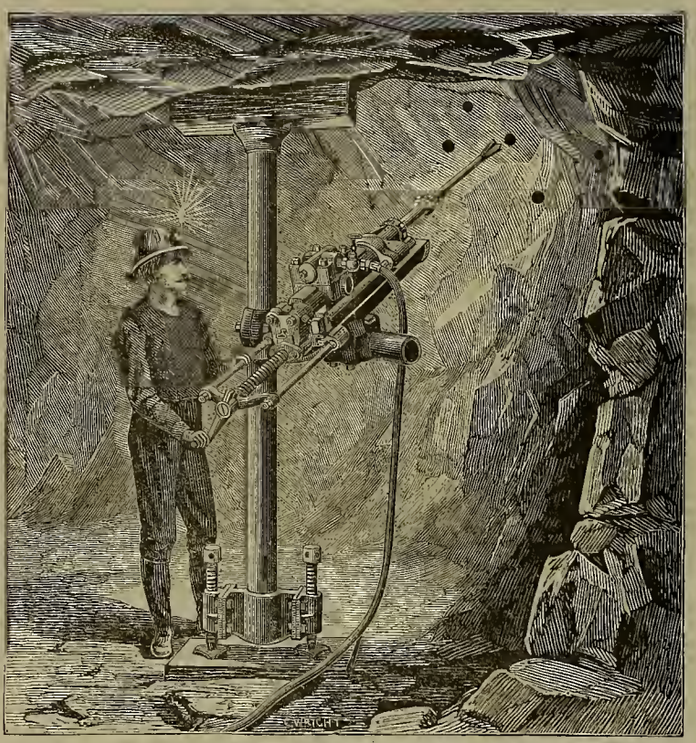

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Ingersoll, D2 3", beat National 3½"	.505	" "
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BOILER SCALE
Preventive and Remover.

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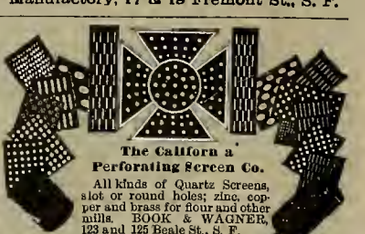

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All kinds of Quartz Screens, slot or round holes; zinc, copper and brass for flour and other mills. BOOK & WAGNER, 123 and 125 Beale St., S. F.

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For working gold and silver ores by wet or dry crushing. The Stetefeldt, Howell's Improved White, Stanton's & Bruckner Furnaces, for working base ores. Rotary Dryers, Stetefeldt Improved Dry Kiln Furnaces.

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CORLISS ENGINES from 12x36 Cylinders to 30x60. PLAIN SLIDE VALVES from 6x10 to 36x36. BOILERS of every form, made of Pine Iron Works O. H. No. 1 Flange Iron, or Otis Steel. Workmanship the most careful. All Rivets Hand Driven.

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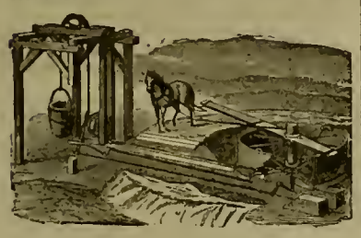

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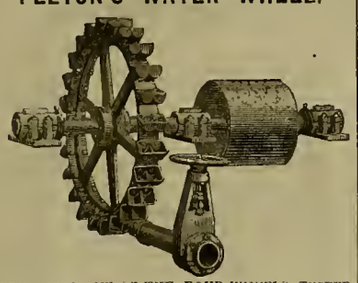

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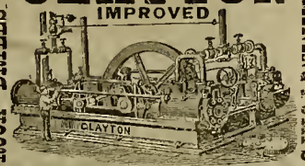

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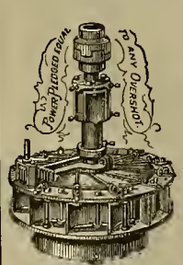

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Manufactured of BEST STEAM METAL. We claim the following advantages over all other Valves and Gauge Cocks now in use:

1. A perfectly tight Valve under any and all pressures of steam, oils or gases.
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In Valves having ground or metal seats, should sand or grit get upon the seat it is impossible to make them tight except by regrinding, which is expensive if done by hand, and if done by machine soon wears out the valve, and in most cases they have to be dis connected from the pipes, often costing more than a new valve. The JENKINS Disc used in these Valves is manufactured under our 1880 Patent, and will stand 200 lbs. steam. Sample orders solicited. To avoid imposition, see that Valves are stamped "Jenkins Bros." For sale by

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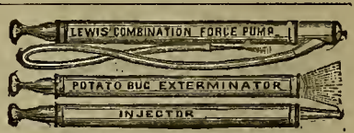

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Arizona Notes.

[From a Tucson correspondent.]

EDITORS PRESS:—Affairs in this vicinity are exceedingly quiet. People are apparently waiting for developments in Quijotoa. There is some talk of the introduction of water from the Santa Catarina, and surveys have been made with an idea of bringing water to the city from this source, which is said to be at an elevation of about 10,000 feet above sea level. Some of the prominent citizens are taking part in the enterprise, and the scheme will probably be offered in San Francisco with the idea of getting capital there.

The stage line from Casa Grande has drawn off the regular trips to Quijotoa, but two lines of stages run daily from Tucson to that famous district.

On the evening of the 10th news was received of a strike on the east side of Quijotoa, in both the Peerless and Crocker ground, where some ore of fair grade is reported as struck. Our papers here published it as a rumor, but it is nevertheless a fact.

It is stated that the tunnels are open to inspection of the public, which is a new turn in the state of affairs, as it is commonly understood that the miners are not allowed to come down from the top of the hill; and by general experience I should think this true, as I was stopped on the trail and not allowed to go up. It is to be hoped these rumors of a strike are correct, as everything here in Tucson appears dependent on the success of these properties. We know that the several tunnels have been driven in both sides of the hill, but as yet nothing definite of any ore being found is learned. In fact it seems strange that the bonanza people should choose to grope in the dark before determining what they had.

The Babroquiva water scheme has been taken up by some Eastern parties; and to us old pioneers it seems strange that any one should put their money into such an enterprise. It is not long since I made a "dry camp" on this identical spot. Water runs here at certain seasons, but during September and October there is little water to be found, and the "solitary horseman" has to quench his thirst elsewhere.

They say the boys are going to strike it rich over at the Covered Wells. Everybody wishes them well. Sanlsbury & Co. keep their boys hunting the country for smelting ores for their smelter at Benson. They thought they had struck it rich in a carbonate mine near Phœnix the other day, but the ore did not "hold up." At Hassayampa they had a good galena mine, but have worked out their first deposit.

A number of mining men have passed through our town within the past few weeks for the purpose of investigating some of the rich mines of this region of the country. Among them was Prof. Price. We hear he has been over at Bisbee to see the Copper Queen. It is to be hoped he found the mine in good shape, with lots of copper for our English friends, though our information from there does not warrant us in making this statement, as we are afraid it is a little weak in the bottom, the lower levels having "gone back" on them. However, I give you this for what it is worth. X.

COPPER.—Liverpool advices state that American arrivals of copper ore and matte continue in large quantities. Arrivals then, for the United States in June, equaled 1,720 tons of fine copper, and included in the lot was 3,790 tons of copper ore. The market has been dull, and quotations by Lewis & Son's report, are: Good ore of 25 per cent., 10s. 6d.; Chile regulus, 11s. per unit; Chile bars, £54 to £54 5s. Arrivals from Chile in June were 2,096 tons, and from other countries, 3,345 tons fine copper. Chile exports, from June 1st to June 30th, equaled 23,504 tons of fine copper. The total visible supply of copper ore July 1st was 46,641 tons fine. For the first six months of the year Liverpool and Swansea imported from this county 6,918 tons fine copper.

LEAD is selling in Liverpool at £10 15s. to £11 for English; £10 10s. to £11 for Spanish with silver; and £10 5s. to £10 10s. for Spanish without silver.

MR. W. R. ECKART, the Mechanical Engineer of this city, is superintending the construction of the smelter at Anaconda, Montana.

FRASER & CHALMERS, of Chicago, are filling a heavy contract for machinery at the new smelter at Anaconda, Montana.

ANTIMONY is selling in Liverpool at £41. and £42 per ton.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNAL.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M Co	California	5	1.50	June 23	July 28	Aug. 14	A. Judson	320 Sansome st
Alpha Con M Co	Nevada	18	50	July 16	Aug 21	Sept 10	W Willis	309 Montgomery st
Alaska M and M Co	Alaska	7	1.00	July 22	Aug 26	Sept 15	E F Stone	306 Pine st
Boracic Acid M Co	California	3	05	July 21	Aug 25	Sept 15	H C Dwight	309 Montgomery st
Belmont M Co	Nevada	37	15	May 26	June 30	July 28	J W Pew	310 Pine st
Bodie Tunnel M Co	California	9	20	June 30	Aug 2	Aug 20	C O Harvey	309 California st
Butte Creek Hyd. M Co	California	9	10	May 13	July 10	July 30	B L Taylor	230 Montgomery st
Best & Belcher M Co	Nevada	30	50	July 9	Aug 14	Sept 2	W Willis	309 Montgomery st
Benton Con M Co	Nevada	13	25	July 22	Aug 26	Sept 15	W H Watson	302 Montgomery st
Caborca M Co	Mexico	9	05	July 18	Aug 22	Sept 22	H C Edgerly	328 Montgomery st
Con Amador M Co	California	7	50	July 21	Aug 21	Sept 10	F B Latham	408 California st
Chollar M Co	Nevada	14	50	July 23	Aug 26	Sept 15	C L McCoy	309 Montgomery st
California M Co	Nevada	12	20	May 20	June 27	July 24	C P Gordon	309 Montgomery st
Columbus Con M Co	Nevada	3	25	June 2	July 7	July 28	J M Buttington	309 California st
Champion M Co	California	15	10	June 13	July 17	Aug 6	T Wetzel	322 Montgomery st
El Dorado South Con M Co	Nevada	14	2.00	July 14	Aug 14	Sept 4	D M Kent	330 Pine st
Enterprise M Co	California	1	15	July 1	Aug 15	Sept 5	W Van Bokke'en	419 California st
Excelsior Water Co	California	6	50	Jan 28	July 1	July 29	H B Wheaton	215 Sansome st
Gould & Curry S M Co	Nevada	48	50	June 6	July 11	Aug 4	A R Durbrow	309 Montgomery st
Humboldt Hill M & M Co	California	1	15	July 15	Aug 18	Sept 5	I Stadfeld	419 California st
Mayflower Gravel M Co	California	25	10	July 10	Aug 12	Sept 5	J Morizio	328 Montgomery st
Mammoth Bar G M Co	California	6	15	June 9	July 11	Aug 1	J W Pew	310 Pine st
Mexican G M Co	Nevada	27	75	June 11	July 16	Aug 6	C E Elliott	309 Montgomery st
Morgan M Co	California	1	1.00	June 7	July 11	July 30	C S Neal	309 Montgomery st
Mono G M Co	California	21	50	July 8	Aug 12	Sept 1	G W Sessions	309 Montgomery st
North Peer M Co	Arizona	1	2.00	June 12	July 17	Aug 11	H Deas	309 Montgomery st
Pittsburg M Co	California	10	05	July 11	Aug 15	Sept 5	C G Brooks	210 Front st
Peer M Co	Arizona	1	25	June 6	July 15	Aug 5	A Waterman	309 Montgomery st
Real Del Castillo M Co	Mexico	2	20	June 28	Aug 4	Aug 22	A Judson	320 Sansome st
Rainbow M Co	California	11	15	June 16	July 21	Aug 13	F F Mohrhardt	311 Montgomery st
Starlight M Co	California	1	05	June 14	July 18	Aug 6	W Battles	513 Market st
Silver Hill M Co	Nevada	20	05	June 2	July 3	July 29	W E Dean	309 Montgomery st
Scorpion S M Co	Nevada	18	10	June 25	Aug 1	Aug 22	G S Spinney	310 Pine st
Union Con M Co	Nevada	27	50	June 9	July 14	July 31	J M Buttington	309 California st
Utah S M Co	Nevada	49	50	June 19	July 25	Aug 13	G C Pratt	309 Montgomery st
Valapara M Co	Mexico	2	20	June 28	Aug 4	Aug 22	A Judson	320 Sansome st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	METING.	DATE.
Benton Con M Co	California	W H Watson	328 Montgomery st	Annual	July 30
Derbec Blue Gravel M Co	California	T Wetzel	322 Montgomery st	Annual	Aug 5
Lady Washington Con M Co	Nevada	W H Watson	328 Montgomery st	Annual	July 30
McMillen M Co	Nevada	J Morizio	328 Montgomery st	Annual	Aug 6
New York Hill M Co	California	J B Leightner	527 Clay st	Annual	July 29
Rustler G M Co	California	A F Main	418 Jackson st	Special	July 26

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	May 15
Bodie Con M Co	California	G W Sessions	309 Montgomery st	50	June 7
Derbec Blue Gravel M Co	California	T Wetzel	322 Montgomery st	10	July 29
Idaho M Co	California			4.00	Apr 2
Jackson M Co	California	D C Bates	309 Montgomery st	10	Mar 16
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 21
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Apr 28
Standard Con M Co	California	W C Wills	303 Montgomery st	25	Mar 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Apr 2

To Subscribers.

While our paper is, generally speaking, very prosperous, the publishers find themselves more than usually in need of money at this time, as our expenditures are constantly large. Those who have been waiting for busy times, or for other reasons, before renewing subscriptions and making payments to this office, are now kindly urged to favor us at as early a date as possible. Also, please remember that it is a good season to suggest to others that they, too, profit by subscribing. We hope to hear from many within the next few weeks, from all along the line of our large subscription list of intelligent and appreciative readers.

Mining Share Market.

There has been a pretty lively market for stocks during the week, but prices have not been maintained. At the north end of the Comstock the outlook is improving. In the bottom of the deep winze the rock is changing for the better. Porphyry is beginning to take the place of the black bastard quartz in which they have for sometime been sinking. As yet this porphyry is in detached bunches, but doubtless a permanent stratum will soon be reached, and in connection with this fertile quartz may be expected.

In the Best and Belcher and Gould and Curry they are making a start, looking to extensive explorations in their upper levels in sections of the two mines where there are large areas of virgin ground.

At the Hale and Norcross work has not yet been resumed on the 2800 level. The last work done on that level showed better material than any heretofore found at that point.

At Gold Hill the Yellow Jacket, Crown Point and Belcher Companies are extracting and sending to mills on the Carson river the usual quantity and quality of ore.

At the Alta they have the diamond drill in a distance of about 500 feet in advance of the west drift on the 2150 level. They have thus far found no water that will interfere with the running of a drift to the westward.

Bullion Shipments.

Stormont, July 15, $2,540; Nevada, 15, $4,000; Horn Silver, 15, $12,000; Ontario, 15, $6,638; Horn Silver, 16, $12,000; Ontario 10, $18,402; Horn Silver, 17, $6,000; Ontario, 18, $5,994; Horn Silver, 18, $12,000; Crescent, 10, $2,850; Nevada ore, 19, $2,600; Horn Silver, 19, $6,000; Ontario, 19, $12,119; Horn Silver, 20, $9,000; Ontario, 20, $6,704; Bodie, 22, $11,585; Navajo, 21, $10,000; Bodie, 23, $11,585; Bonanza King, 11, $10,634.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
J. J. BARTELL—Sacramento county.
A. S. DENNIS—San Mateo county.
C. D. MCDUFFIE—Sacramento county.
B. W. CROWELL—Fresno and Tulare counties.
A. C. KNOX—Sonoma and Marin counties.
JOHN H. STURCKE—Santa Clara and San Benito counties.
GEO. MCDOWELL—Nevada and Placer counties.
WM PASCOE.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 3.		WEEK ENDING July 10.		WEEK ENDING July 17.		WEEK ENDING July 24.	
Alpha	.80	.70	1.75	1.10	1.65	.85	1.45	
Alta	1.90	2.10	1.90	2.15	2.05	3.45	2.60	3.10
Andes	.30	.35	.40	.45	.45	.70	.40	.45
Argenta								
Belcher		.70	.75	.85	.95	1.50	.95	1.15
Belding								
Best & Belcher	1.50	2.10	2.10	2.70	2.15	3.50	2.15	2.90
Bullion	.35	.10	.40	.50	.65	1.20	.65	.95
Bonanza King								
Belle Isle	.60	.70	.65	.75	.35	.65	.55	.60
Bodie Con	3.20	3.65	2.15	3.50	1.35	2.10	1.50	1.70
Bodie	.50	.55	.45	.55	.45	.75	.50	.70
Bodie Tunnel		.20						
Bulwer		.50	.50	.55	.35	.50		
California	.20	.25	.25	.30	.20	.45		.30
Challenge				.20		.25	.20	.25
Champion								.10
Chollar	1.00	2.15	2.05	3.10	3.15	4.75	3.70	5.1
Confidence					1.00	1.75		1.50
Con. Imperial				.10		.10		
Con. Virginia	.15	.30	.25	.35	.30	.50	.30	.45
Con. Pacific	.40	.50		.40	.40	.45		.45
Crown Point		1.15	1.20	1.40	1.40	2.00	1.30	1.50
Day								
Eureka Con				2.50	2.00	2.50		2.50
Eureka Tunnel								
Exchequer		.25		.30	.35	.50	.30	.45
Grand Prize				.35	.35	.40	.30	.40
Gould & Curry	.55	1.00	.85	1.80	1.65	2.55	1.75	2.45
Goodshaw				.15				
Hale & Norcross	2.65	2.90	2.80	4.55	4.20	6.2	4.75	7.00
Holmes								
Independence								.30
Julia								
Justice					.25	.35	.30	.35
Martin White								
Mono	.45	.60	.30	.65	.35	.40	.20	.35
Mexican	.80	.90	.75	1.10	1.00	2.65	1.95	2.60
Mt. Diablo				2.00		2.00		
Northern Belle								
Navajo	3.80	3.90	4.05	4.25	3.75	4.10	4.10	4.20
North Belle Isle		.20		.20				.20
Occidental		.90	1.25	1.50	1.35	1.70	1.40	1.50
Ophir	.80	.85	.85	1.10	1.10	2.25	1.55	1.80
Overman		.15	.20	.30	.25	.40	.20	.25
Potosi	.40	.80	.80	1.80	1.50	2.30	1.80	2.50
Pinal Con								
Savage	.70	.80	.80	1.15	1.15	1.70	1.30	1.95
Seg. Belcher		1.25		1.50				
Sierra Nevada	1.00	1.10	1.05	1.50	1.50	2.50	1.60	2.00
Silver Hill				.10		.10		.10
Silver King		5.25		5.00			4.75	5.00
Scorpion		.10		.15	.20	.40	.20	.25
Syndicate		.50	.45	.50	.45	.50	.45	.50
Tioga								
Union Con	.65	.75	.70	.95	.95	2.40	1.70	1.90
Utah		1.00		1.35		2.15	1.90	2.00
Yellow Jacket		1.35	1.90	2.05	2.35	2.75	2.00	2.25

Sales at San Francisco Stock Exchange

THURSDAY A. M., July 24.			AFTERNOON SESSION.		
820	Alta	2.20@2.25	30	Andes	.40c
200	Alpha	1.15	1400	Alta	2.50@2.60
50	Andes	.45c	350	Alpha	1.20@1.25
230	Bodie Con	1.50	300	Belle Isle	.60c
400	B. & Belcher	2.05@2.10	250	Bodie	1.70
650	Belle Isle	.35@.60c	1050	B. & Belcher	2.30@2.35
170	Bullion	.80@.85c	2800	Benton Con	.45c
900	Con. Virginia	.35c	50	Bullion	.90c
525	Chollar	3.80	2300	Con. Virginia	.33c
2000	California	.25c	100	Crown Point	1.40
20	Crown Point	1.35	1700	California	.25c
100	Caledonia	.10c	525	Chollar	4.20@4.25
10	Challenge	.20c	200	Exchequer	.40c
700	Exchequer	.45c	620	Gould & Curry	2.20
150	Eureka Con	2.75	1470	Hale & Nor	.6@65
550	Gould & Curry	2.25@2.35	100	Independence	.25c
300	Hale & Nor	5.75@5.8	480	Justice	.25c
200	Justice	.25c	200	Mono	.25c
235	Mexican	2.30@2.35	560	Mexican	2.35
200	Navajo	4.20@4.1	400	Navajo	4.20@4.25
530	Ophir	1.55@1.60	150	Ophir	1.65@1.70
430	Potosi	2.15@2.10	250	Sierra Nevada	1.60
740	Savage	1.60@1.65	100	Utah	1.70
580	Sierra Nevada	1.90	550	Union	1.80
50	Union	1.70	40	Yellow Jacket	2.10

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward' Gardens is a day well spent.

News in Brief.

QUEEN VICTORIA has telegraphed congratulations to President Arthur on the Greely rescue.

A GENERAL complaint is made in Solano county that melon vines are being destroyed by some kind of insects.

THE tax valuation of Chicago is real and personal, about $133,000,000; that of Cincinnati for the same year (1883) was $169,000,000.

TWENTY-SIX glass blowers have arrived in this city from Eastern glass works, to work for the San Francisco and Pacific Glass Works.

THE Purissima Oil Company struck considerably more oil and gas yesterday at a depth of 108 feet.

DURING the past year the receipts of the Society for the Prevention of Cruelty to Animals aggregated $12,372.50, and expenses $1,769.48.

THE Holiness Association, a religious organization of this coast, with headquarters in San Francisco, is building a tabernacle in Oakland.

THE effect on the summer travel to Europe caused by the outbreak of cholera is said to be simply enormous.

THE First Cremation Society of San Francisco appointed a committee to draft a petition to the Legislature, which will be endorsed by physicians, advocating burning the dead.

J. M. THOMPSON and others propose to bring water from North Beach through Stockton street to the corner of Fourth and Market, for use in salt water baths.

THE condition of the Thames excites alarm in London, for the sewage, though discharged far below the city, washes up past the House of Parliament.

THE Government has decorated Dr. Koch with the cross of the Legion of Honor in recognition of his researches as to the source and spread of the cholera.

THE loss from the great fire Saturday at Crane wharf, Wapping, reaches $2,500,000. The largest quantities of oil stored at the wharf were not much damaged.

THE machinery for the electric lighting of Holl Gate is so nearly completed that it is expected to be in operation by the first week in August.

THE assessment rolls of Napa county show a valuation of property in Napa county of $11,-014,000, which is an increase of $385,000 over the assessment of last year, including the 10 per cent added by the State Board.

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, July 24, 1884.

ANTIMONY—Per pound	14 @	15
BORAX—Per Pound (extra)	16 @	—
IRON—Glengarnockton,	25 00 @	—
Eglinton, ton	24 00 @	—
American Soft, ton	27 00 @	—
@	—	
Oregon Pig, ton	— @	—
Clipper Gap, Nos. 1 to 4	30 00 @	32 00
Clay Lane White	23 00 @	—
Shotts, No. 1	26 00 @	—
Refined Bar	3½@	3
Boiler, 1 to 4	5 00 @	5 50
Plate, 5 to 10	4½@	4½
Nail Rod	7½@	—
Norway, according to thickness	6¾@	7½
STEEL—English Cast, lb	14 @	15
Black Diamond, ordinary sizes	14 @	15
Drill	15 @	—
Machinery	12 @	14
COPPER—Ingot	22 @	—
Braziers' sizes	32 @	—
Fire-box sheets	28 @	—
Bolt	25 @	28
Old	12½@	15
Bar	— @	—
Cement, 100 fine	12 @	—
LEAD—Pig	4½@	—
Bar	5½@	6
Pipe	7 @	—
Sheet	8 @	—
Shot, discount 10% on 500 bags: Drop, ⅘ bag	2 00 @	—
Buck, ⅘ bag	2 20 @	—
Chilled, do	2 40 @	—
TIN PLATES—Charcoal	6 00 @	6 50
Coke	6 00 @	—
Banca tin	22 @	23
I. C. Charcoal Roofing, 14x20	6 25 @	6 50
ZINC—By the cask	18 @	—
Sheet, 7x3 ft, 7 to 10 lb. less the cask	9 @	10
NAILS—Assorted sizes	3 25 @	—
QUICKSILVER—By the flask	29 00 @	—
Flasks, new	1 05 @	—
Flasks, old	85 @	—

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First streee, a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below costs, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. References as to above can be had upon applying to this office.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.]

FOR WEEK ENDING JULY 15, 1884.

302,083.—STOVE POLISHING BRUSH—A. D. Arper, S. F.

301,954. SWINGING DEMIJOHN AND LABEL HOLDER—L. Brand, Alameda, Cal.

301,957.—ATTACHMENT FOR BILLIARD TABLES—E. Brunswick, S. F.

301,967.—HAND BLOWER—Geo. Cumming, S. F.

301,885.—FIRE PLACE—F. D. Haven, Albany, Or.

301,857. CARTRIDGE IMPLEMENT—H. T. Hazard, Los Angeles.

301,985.—GANG PLOW—Robt. Hendricks, Woodside, Cal.

301,988. SPRING SEAT FOR WAGONS—J. Hodgess, Loyalton, Cal.

301,992.—OPERATING PUMPS IN MINES—P. A. Humbert, S. F.

301,993.—PUMP—P. A. Humbert, S. F.

302,003.—HYDRAULIC ELEVATOR—A. F. Knorp, S. F.

302,012.—CLUTCH—W. Mathews, San Jose, Cal.

302,024.—SAFETY GUARD FOR CARS—L. Peterson, S. F.

302,040.—STEP LADDER—E. A. Shumway, Walnut Creek, Cal.

301,932.—WATER CLOSET VALVE—Wm. Smith, S. F.

302,179.—WATER METER—Frank Walker, Tombstone, A. T.

302,066.—STEP AND EXTENSION LADDER—Robt. Walker, Oakland, Cal.

NOTE. Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

STEP AND EXTENSION LADDERS.—Robert Walker, Oakland. No. 302,066. Dated July 15, 1884. This ladder is one that may be used as an extension or step ladder at will. It consists of two ladder sections united by a rod and slotted connections, so that the two parts being united at one end may be separated at the other in a manner of an ordinary step ladder; or by extending the two in line they may be locked together, so as to form a rigid continuous ladder of nearly double the length of either section.

SAFETY GUARDS FOR CARS. Lewis Peterson, S. F., No. 302,024. Dated July 15, 1884. This safety guard for cars and other heavy moving objects, consists of a combination of devices. The principal object is to prevent such accidents to life and limb as are of frequent occurrence in cities, occasioned by persons being run over by street cars. The safety guard, patented, may be applied to cars and moving bodies of all kinds to prevent any object in front of the car from being run over or injured to any considerable extent.

STEP-LADDER AND TRESTLE.—Edward A. Shumway, Walnut Creek, Contra Costa Co., Cal. No. 302,040. Dated July 15, 1884. This invention relates to an improved construction for step-ladder trestles, or supporting frames, which have the upper ends united together so that the lower end may be separated to form a bracing-support. It consists of side-bars, with their upper ends bored out at their meeting points to receive short cylinders, which fit half in each bar, and are retained in place by straps. The upper ends of the bars are cut away to form an obtuse angle with the inner edges at this point, to allow the lower ends to be opened and closed. The device may be applied to a step-ladder having steps on one side and braces at the other, or it may be used upon what is known as a "French ladder," having steps on both sides, or upon trestles, such as are used by painters and others.

SAW MILL SET WORKS.—Ambrose A. Osborn, S. F., No. 301,828. Dated July 8, 1884. This is what the inventor terms "power set works" for saw mills; and it consists of a mechanism, by which the log may be set upon the carriage for any desired cut, and a dial or indicator connected with said mechanism, so that the amount set may be shown at once. In saw mills where long logs are to be sawed, considerable time must be consumed in setting the logs for a new cut each time after the carriage has been run back, and also set all the standards equally throughout the whole length of the log. These improved set works simplify the whole operation.

Prompt Payment Needed.

It would be of great assistance to the publishers of this journal to have all its patrons renew their subscriptions promptly, save the expense of collections, avoid the changing and shifting of the position of the names on the printed mail list, and prevent some of the chances of errors occurring in addressing and mailing our very large list of subscribers. We, therefore, kindly urge upon all those who possibly can to renew their subscriptions early.

It is important to us that all not now paid in advance remit and place their credit ahead for a year. Verily every enterprising publisher heartily appreciates his list of promptly paying patrons. We hope our friends will not delay forwarding their postal orders because a single subscription is small in amount. We need the support of every intelligent person interested in the objects to which our paper is devoted. It is the interest of all such that the paper should be well sustained.

We have endeavored in every way to make this journal so valuable to its readers as to render it almost indispensable. No man can read it who will not likely find at least one or more single copies during the year, containing something worth many times the subscription price.

How to Remit to this Office.

ALWAYS GIVE THE NAME OF YOUR POSTOFFICE every time you write to us for any purpose. We cannot find your name on our large lists unless you do. Also write your own name plainly, and the name of the paper you remit for.

THERE ARE FOUR WAYS BY WHICH MONEY, in payment for this paper, can be sent by mail at our risk—by a POSTOFFICE MONEY ORDER, by a REGISTERED LETTER, by a BANK DRAFT or POSTAL NOTE.

MONEY ORDERS CAN BE OBTAINED at the Postoffices of most of the large towns. For the small amount of eight cents you can buy a Money Order upon the San Francisco Postoffice, for the amount you wish to send us, and WE WILL BE RESPONSIBLE for its safe arrival.

REGISTERED LETTERS. If a Money Order Postoffice is not within your reach, ask the Postmaster of your town to register the letter you wish to send us. It costs but ten cents. Then, if the letter is lost or stolen, it can be traced. You can send money in this way AT OUR RISK.

BANK DRAFTS.—A Draft upon any San Francisco, New York, or Washington, D. C., bank, we can use, if it is made payable to the order of the publishers of this paper, San Francisco.

POSTAL NOTES CAN BE OBTAINED for sums less than five dollars at all Postoffice Money Order Offices. For a Postal Note you must pay three cents, and the Postal Note must be inclosed in your letter to us. These Postal Notes are payable to bearer, and therefore ARE NOT SO SAFE AS A MONEY ORDER.

SMALL SUMS of money generally reach us in an ordinary letter, but we cannot be responsible for losses unless you send in one of the four ways mentioned above.

SILVER BY MAIL.—Do not send over 25 cents in silver by mail unless you wrap it carefully, and put an extra three-cent stamp on the letter for every 50 cents in silver it contains. Failure to observe this may cause your letter to get lost.

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Land Business at Washington.

Having associated with us able counsel at Washington, we are now prepared to obtain Patents upon Pre-emptions, Homesteads, Mines, Mexican Grants, and all classes of Land Entries; and to manage contests before the Commissioner of the General Land Office and the Secretary of the Interior. Advice will be furnished upon favorable terms. All business will be attended to promptly and on reasonable terms.

DEWEY & CO., Patent Solicitors.

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Rubber Boot
WILL NOT SWEAT THE FEET.
WILL.....
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ALLEN, Agent for Pacific Coast,
116 Market St., San Francisco.

ASSESSMENT NOTICE.
Gould & Curry Silver Mining Company.
ASSESSMENT No. 48.

Levied	June 18
Delinquent	July 11, 1884.
Day of sale	August 4, 1884.
Amount	Fifty cents per share.

ALFRED K. BURROW, Secretary.
OFFICE Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

SURVEYORS—INVENTORS.
A. SUTRO, Mathematical Instrument and Model Maker, 335 Bush street, S. F. Scientific Apparatus and Experimental Machinery at short notice.

Lost Papers.
If any subscriber fails to receive this paper promptly, after making due inquiries at the Postoffice, he is urgently requested to notify this office by *letter*, that we may send the missing papers, and, if possible, guard against further irregularities.

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AND
MECHANICS' FAIR
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INSTRUMENTAL CONCERT
By an efficient Orchestra each afternoon and evening.
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ADMISSION.
Double season tickets, $5; single season, $3; apprentice season, $1.50; child's, $1.50; adult single admission, 50 cents; child's, 25 cents; SEASON TICKETS TO MEMBERS OF THE INSTITUTE AT HALF-PRICE.
Any desired information given or sent on application to the Secretary, 31 Post street.
P. B. CORNWALL, President.
J. H. CULVER, Secretary.

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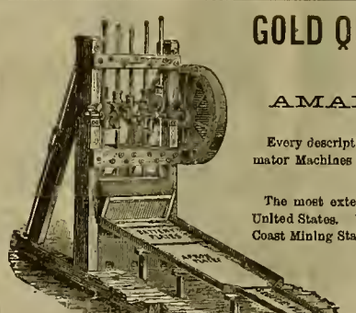
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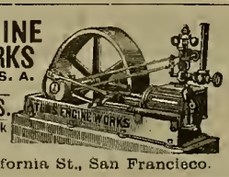

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THE ALBANY VALVOIL,
THE ALBANY CYLINDER OIL,
The Sight Drop Cylinder Lubricator.
WE ALSO IMPORT
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☞ These Lubricants have been for the last eight years, and are now, in general use in nearly all the mills, mines and steamers on this Coast, and the fact that the demand constantly increases is sufficient evidence of their superiority.

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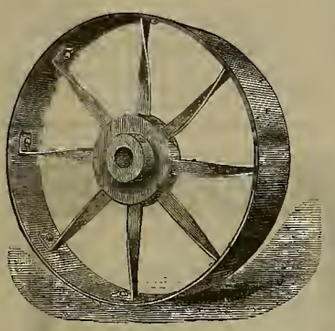
MACBETH'S
—PATENT—
STEEL PULLEY.



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They are carefully balanced. They are subject to no contraction strains, and can be run at very high speed without danger of bursting.

On account of their great lightness and the form of the arms, they absorb less power than any other pulley.

They are *the only pulley of the kind* which runs true. They cannot be broken in transport.

TESTIMONIAL:

MATHER LANE SPINNING CO. (Limited), LEIGH, ENGLAND, Nov. 5, 1883.

N. Macbeth, Esq.— Dear Sir: The Patent Steel Pulleys supplied throughout to our No. 2 Mill are working to our entire satisfaction.

They are very true, and are about 50 per cent lighter than the cast-iron pulleys in our No. 1 mill.

Yours faithfully,
For the Mather Lane Spinning Co. (Limited),
[Signed:] RICHARD T. MARSH, Managing Director.

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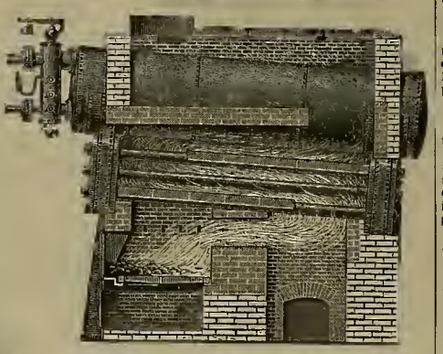


Economy in space and fuel. Safety at high pressures. Freedom from scaling. Equally adapted for power and heating purposes. Especially adapted for mills, factories, hotels, stores or any place where safety is a necessity. Will work well with muddy water and any kind of fuel.

TESTIMONIALS.

ST. LOUIS, MO., Sept. 28, 1883

Messrs Adolphus Meier & Co. GENTLEMEN: We cheerfully certify that the "*Heine Patent Safety Boiler*" put up by you in our establishment has proved very satisfactory in its working. The chief points of excellence in the "Heine Safety Boiler" are its economy in fuel and space, freedom from scaling, aptitude for power and heating purposes, working equally well with clear and muddy water. We warmly recommend it to all using steam machinery. Yours truly,

ANHEUSER-BUSCH BREWING ASS'N

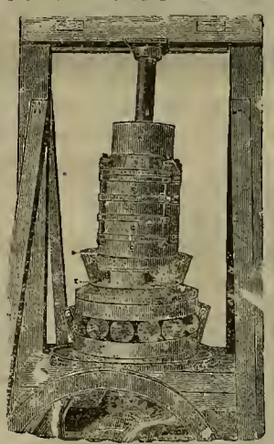
OFFICE OF SUP'T OF ROYAL RAILWAYS, BERLIN, Sept. 23, 1883.

To Mr. H Heine, Civil Engineer: In reply to your inquiry of September 2d, we respectfully inform you that the three boilers built under your patents, under steam since September 25, 1881, at the Alexander Place Depot, as well as the two at Friedrich Strasse Depot, under steam since September 22, 1882, have given good satisfaction, requiring no repairs whatsoever to date. The internal cleaning of the boiler was always accomplished with ease on account of the convenient arrangement of the tube caps, the adhesion of scales being fully prevented thereby, and the boilers kept in prime condition.

(Signed): BRAUCKE.

Send for Circular and Prices.

F. P. BACON, PRESIDENT C. L. FOUTS, SECRETARY
THE GLOBE IRON WORKS COMPANY



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The PACIFIC WATER JACKET SMELTERS embrace many features that are entirely new and of great practical utility, which are covered by letters patent.

No other furnaces can compare with these for durability and in capacity for uninterrupted work.

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These Smelters are shipped in a complete state, requiring no brick or stone work, except that for the crucible, thus saving great expense and loss of time in construction.

Complete smelting plants made to order of any capacity and with all the improvements that experience has suggested as valuable in this class of machinery. Skilled and experienced smelters furnished when desired to superintend construction and running of furnaces. Estimates given upon application. Send for circular.

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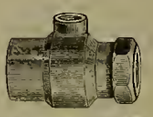

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FOR IRRIGATING PURPOSES
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NO VALVES! NO PISTON!
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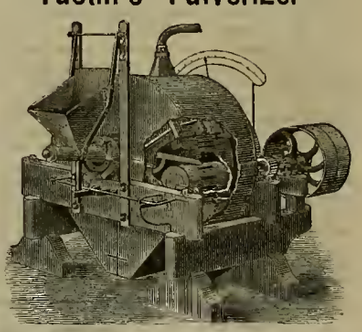

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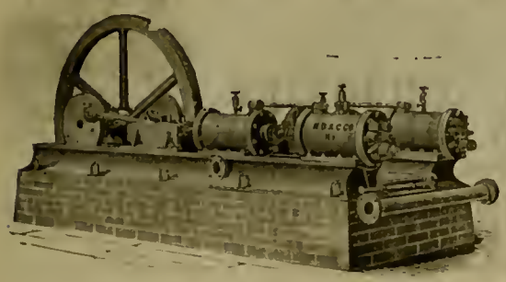

EDWARD A. RIX, Agent,

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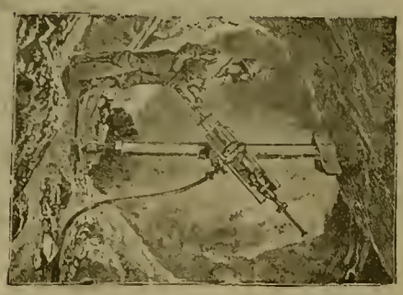
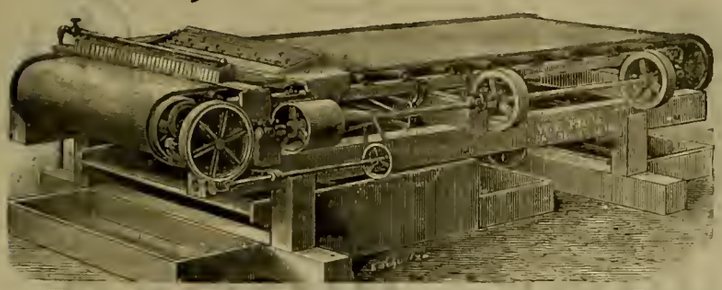
Anyone, upon examining, will proclaim to be far superior to anything yet offered to the Mining Public in the shape of a ROCK DRILL.

CALL AND SEE IT OR SEND FOR CIRCULARS.



$1,000 CHALLENGE!



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To those Intending to Manufacture or Purchase the So-called "Triumph" Concentrator, we Herewith State:

That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That we are and have been ready, at any time, to make a competitive trial against the Triumph, or any other machine, for stakes of $1,000.

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Room 7 No. 109 California Street, - - - SAN FRANCISCO, CAL.
January 3, 1884.

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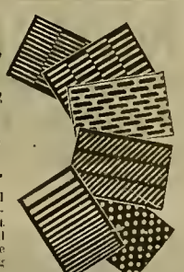
[ESTABLISHED 1860.]

Inventors on the Pacific Coast will find it greatly to their advantage to consult this old experienced, first-class Agency. We have able and trustworthy Associates and Agents in Washington and the capital cities of the principal nations of the world. In connection with our editorial, scientific and Patent Law Library, and record of original cases in our office, we have other advantages far beyond those which can be offered home inventors by other agencies. The information accumulated through long and careful practice before the Office, and the frequent examination of Patents already granted, for the purpose of determining the patentability of inventions brought before us, enables us often to give advice which will save inventors the expense of applying for Patents upon inventions which are not new. Circulars of advice sent free on receipt of postage. Address DEWEY & CO., Patent Agents, 252 Market St., S. F.

A. T. DEWEY. W. B. EWER. GEO. H. STRONG.



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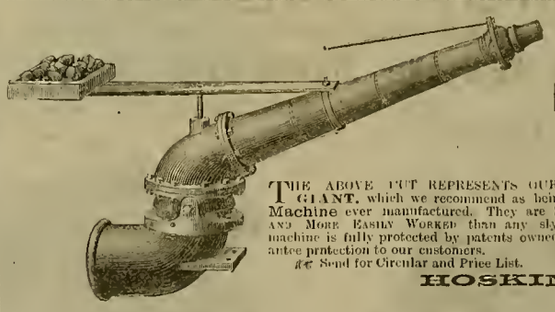

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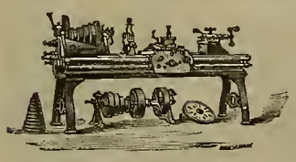
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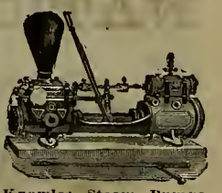
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WIRE ROPE, Flat and Round, of the best material and workmanship. Large Stock always on hand. Special sizes made to order.

WIRE Of all kinds for Telegraph and Telephone purposes, Baling Hay, and all purposes that wire can be put to. Brass and Copper—Galvanized.

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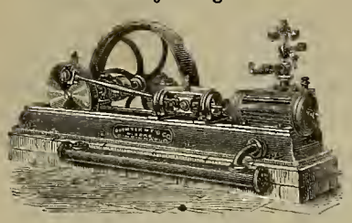
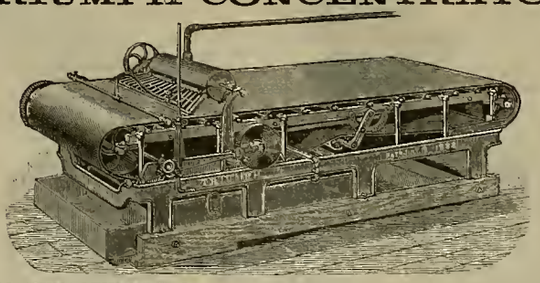
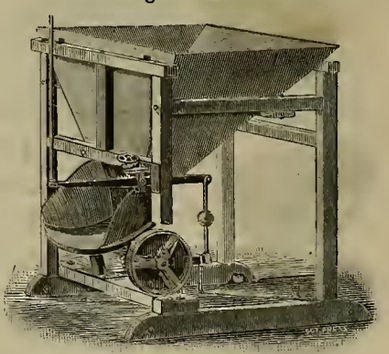




"Challenge" Ore Feeders.



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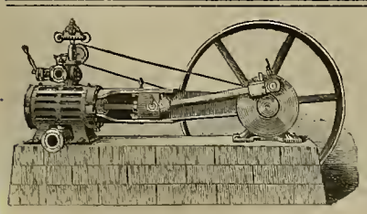

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Heavy Automatic and Slide-valve Engines.
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SPECIALTIES.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, AUGUST 2, 1884.

VOLUME XLIX Number 5.

Work for Boys and Girls.

One of the lately formed institutions in this city, which is doing a good work in aiding boys and girls to earn a livelihood, is the Technical School of the Cigar Manufacturers' Association. For years the work in the local cigar factories has been almost entirely done by Chinese. Trouble between these men and their employers, some time since, caused the latter to take into consideration a plan to teach boys and girls the trade of cigar making, in order that they might be employed instead of Chinese. The Technical School referred to was the result. This school was established only about four months ago, and has already graduated upwards of one hundred young men and women, who are now earning wages and supporting themselves by their labor in the various cigar manufactories of this city. These manufactories could, and cheerfully would, give like employment to five thousand operatives of that character.

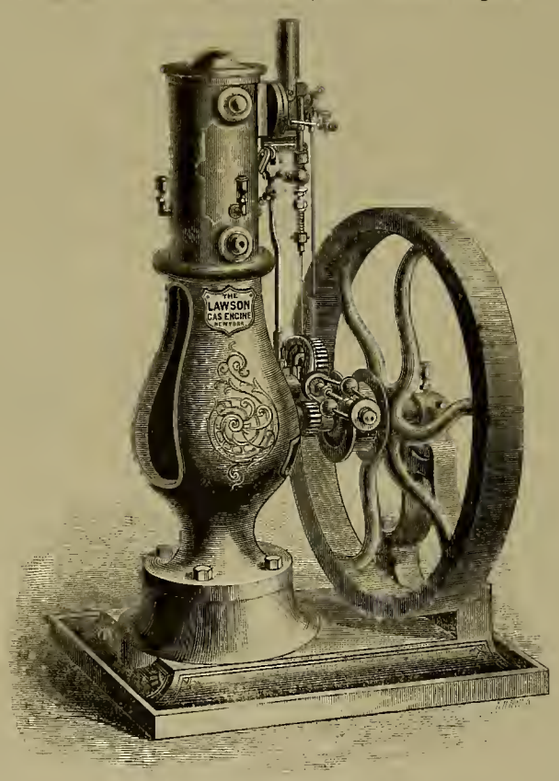
There are always, unfortunately, in large cities, many poor families who have children growing up in idleness, utterly unprepared for any calling in life, and who eventually recruit the hoodlum classes. The ignorance and natural shiftlessness of many of these parents, or possibly their poverty, which requires so close application to their toil in order to earn their daily bread, prevents them from discovering such opportunities for their children as this school presents. It remains for our more public spirited and benevolent citizens to point out to them their duty and privilege to thus inexpensively provide for their children. This school receives white boys and girls of any suitable age, provides them with tools and material to work with, the constant services of skilled teachers, and all without any charge. In about three months' time, with reasonable attention and close application, the student or apprentice has, so far, mastered the rudiments of cigar making as to be competent to earn wages; and our manufactories are open to all such. No charge is made for this training work, the only requirement being the steady application of the student, his or her compliance with the rules of the school, and proper behavior while under its charge. There must be many young men and women in our midst who would gladly avail themselves of such an opportunity, were their attention called to it. The school is at 634 Sacramento street, and the officers are prepared to receive young people who really desire to learn the cigar making trade. It is only to be regretted that schools of similar nature, applying to other branches of trade, are not established and maintained.

SUPPLEMENT.—We publish with this number of the PRESS, a supplement showing the details of the extensive plant of the California Wire Works, one of our most flourishing home industries. The engraving shows the arrangement of the different parts, which is the result of long experience on the part of the engravers. The new works are much more extensive, and a great deal more convenient than those formerly occupied by the company.

THE North Bloomfield Mining Company talk very strongly of working their ground by the drifting process. If they do this it will be on a big scale. It is also stated that an extensive hydraulic mine at Cherokee will be operated in the same manner. People along the ridge are anxiously waiting for the work to begin.

The Lawson Gas Engine.

The engraving on this page represents the Lawson Gas Pumping Engine, which is just being introduced on this coast by Mr. E. A. Rix, 18 Fremont street. Mr. Rix, while East a short time since, examined several gas engines, and found that the Lawson was in high favor, and was in use in many places. People who had had it in use with other types were adopting it entirely, so he secured the agency for the Pacific Coast. Mr. Rix assures us that the engine costs only five cents an hour for one-horse power; and eight cents an hour for two-horse power, making it an efficient and cheap motion. The engine is compact in form and neat in appearance.



THE LAWSON GAS ENGINE.

This engine has been especially designed to supply a want for a thoroughly reliable, practical and economical method of raising water for French flats, hotels, hydraulic elevators, private residences, and extinguishing fires. The firm some ten years since, were the first to introduce pumping engines for private residences, etc., and their experience has demonstrated that the use of gas as fuel, took altogether too much time, either to make steam, or the requisite heat for hot-air engines; consequently was decidedly too expensive.

In hot-air engines, in which coal is used, they do fair work; the noise from them is a great objection, and the liability of burning out the packings and fire-pots, and warping of the cylinders, makes the question of repairs such a serious matter as would deter those familiar with them from purchasing.

In the Lawson gas engines, in which the gas is exploded in the cylinder, these objectionable features have been obviated. It will pump more than double the quantity of water, for gas consumed by any hot air engine; is made entirely of metal; has no packing to burn or blow out; can be started instantly by simply applying a match, and will pump between 200 and 300 gallons of water before other engines are ready to work.

The engine has few working parts, is positive in its action, and requires little attention or cleaning. Of course all smoke and ashes are done away with, and there is no boiler, steam, fire, extra insurance or engineer. One of these machines will be exhibited at work in the Mechanics' Fair.

A DRILLING MATCH.—The Virginia (Nev.) *Chronicle* states that a novel drilling match between James Flannery and John Hickey, two miners of Gold Hill, took place the other evening on the road near the Crown Point mine. The match was for $50 a side, and the wager was for the purpose of ascertaining who could drill two feet into solid rock in the shortest time. A large crowd of spectators assembled to see the match. The rock was the hardest surface material that could be found. Each contestant had his helper to turn the drill, which was struck with a heavy hammer. Flannery broke six drills by the tremendous force of his blows, but won the match by two and a half minutes. Time: Flannery, 40 minutes; Hickey, 42½. The decision of the referee seemed to be unsatisfactory to a majority of the crowd, who insisted that the match was a tie.

SACRAMENTO county's gold mines, in the vicinity of Folsom, are said to yield between $4,000 and $6,000 per year.

Silica Percentage of Slags.

It is taught in the mining schools that in smelting lead ores the object is to make a singulo-silicate slag, or one between this and a bi-silicate, of the earthy matter in the lead ore, which best enables us to effect its separation from the metallic matter. It is also taught that single singulo-silicates are not as easily fusible as compounds of two or more singulo-silicates: for instance, a compound of the singulo-silicats of ferrous oxide with that of calcic oxide. It was further known in practice for a long time that if, in fluxing an ore, the proportion of lime to oxide of iron is kept as one part of the former to two parts of the latter, a good slag would result; that is, one which will form with the least amount of fuel. Keep the furnace open, and be free from lead and silver. But with all this knowledge, more bad slags than good ones were made, until several thinkers were led to the right track by giving their attention to crystallized slags, which, presumably, are real chemical compounds, and therefore have a constant composition, while amorphous slags might be considered as mere mixtures of different silicates or solutions of one silicate in another.

It was observed that some crystallized slags behaved better than others in a furnace. If such a slag, then, could be made at will, a great problem was solved; any kind of ore could be smelted without the least trouble by giving it the lacking constituents in the same ratio as they are found in the analyzed slag. This necessitates, of course, an accurate knowledge of the slag-constituting ingredients of ore, fluxes and ash of the fuel, which can only be arrived at by chemical analysis and an accurate weighing of all the material in the furnace. Taking all these procautions, a slag of the same crystallization as the typical one will almost invariably result, other things being equal. The expression almost universally is used because Mr. O. H. Hahn, a gentleman of great practical knowledge on this subject, had the experience in Colorado that oxide of zinc seems to prevent crystallization. Mr. Hahn states that the slag-forming matter of an ore which has to be most frequently dealt with in lead smelting consists of the following substances: silica, alumina, the oxides of iron and manganese, lime and magnesia. Barytes and strontia are of rarer occurrence, and the oxides of the alkaline metals exist only in such subordinate quantities that they may be neglected.

All the above-named substances are hardly ever found present in the same gangue, and much less arranged in such a proportion as to yield at once a suitable slag in smelting. By supplying the ore with the deficient ingredients, we *flux* it and form a "smelting mixture." According to the amount of combined silica present in a slag we distinguish three degrees of acidity:

1. Subsilicates, in which the oxide of the bases is to the oxygen of the acid as 2:1 – or, $4RO + SiO_2 = R_4SiO_6$; or $R_2O_3 + SiO_2 = R_2SiO_5$.

2. Singulo-silicate, in which the oxygen of the bases is to the oxygen of the acid as 1:1 – as $2RO + SiO_2 = R_2SiO_4$; or $2R_2O_3 + 3SiO_2 = R_4Si_3O_{12}$.

3. Bisilicate, in which the oxygen of the bases is to the oxygen of the acid as 1:2 – as $RO + SiO_2 = RSiO_3$; or $R_2O_3 + 3SiO_2 = R_2Si_3O_9$.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

The Blind Miner's Geological Discoveries.

EDITORS PRESS:—Leaving gravel mining out of the question altogether, one of the most important questions for this State to understand, physical geology would be of the greatest interest to the world at large. Our ancient drainage system could almost as accurately be mapped out as the modern, over all the world, wherever the interest of the country demanded it. It is laughable to hear correspondents talk about reading geology as plain as print, and then in the next sentence glaringly expose utter ignorance of the whole question. It is all true; it can be read as plain as print, but not by men that can't spell *baker*. There are none so dumb as those who don't want to understand. It is provoking to be treated with the kind of contempt that I am because I think differently from other people. I have always been willing to answer any fair question that I could on this subject: but how have I been met and treated?

There is not a business man in Grass Valley that is sure that he is treating me right by not lending me the least aid to help me through with my hard task; seeing me suffer against odds that no other man would attempt. But I am a philosopher, and I can get along on a thousand or take care of a million, according to my notion; but let me tap pay gravel, and then they will pay me for what I do.

It is business I want, and $500 now would be better than $5,000 the day after I strike pay. I want rest from my anxiety and hardships, and I will have it. I will settle down and be content with just what I can take out myself, and as soon as I can just make myself comfortable, I shall close my mine and not worry myself to benefit other people one dollar. I would rather have a million dollars in my mine that I can take out when I need it, and as I need it, than have the same amount out, where it would be exposed to the games of rascals and journeymen scoundrels that would forever be playing some game I was not looking for. So you see, as I can have the pile to go to, as long as I have sense enough to keep it to myself there will not be much inducement to sell out my chances at any price.

If I had had my sight, and known what kind of men I had to deal with, and not been compelled by poverty and blind helplessness, I would have been a jackass if I had ever whispered what I have discovered. Even as it is, I have been cursed by making it known that I had discovered anything. I would have had far better success if I had pretended to be a *wizard* or *hypocrite* of some sort, and went for the fool side of man, than to have appealed to his good sense. The more I tell him that it is a discovery that other men can understand and practice, the bigger fool he makes of himself and the meaner he acts, and demands at once to be enlightened without the least expense to himself. They suppose that a man can spend his whole life in hard study and labor to work out one of the hardest and one of the most important problems to the public at large and science ever worked out by any man, and then give it away for nothing. H. CLENDENEN.

Randolph Flat, July 20, 1884.

Where Emery Comes From.

As no inconsiderable part of the annual product of the emery mines of this province, writes the United States Consul at Smyrna, is exported to the United States, as it is the sixth article in point of value thus exported, some facts bearing upon this production may not come amiss. For many years one or two parties holding concessions from the Government maintained a virtual monopoly of the emery mining industry, and kept prices accordingly, the rough stone being sold at the rate of £16 sterling per ton. To-day, £5 sterling per ton is an average price. How much of this falling off in price is due to competition, deterioration, or decrease of consumption, can only be estimated. The mines are worked either under "firmans" or concessions, obtained from the Government only with difficulty and large expense, or through contracts made with the "estates of the Church Ottoman," known as "vacouf." In the latter category are the mines of "Gumnah Dagh," near Sokia, and about four hours distant from the station of Azizie, on the line of the Ottoman railway, which station is about seven miles from Ephesus. These mines pay to the "vacouf" a royalty of so much per ton on all the ore extracted, which is transported on mules and donkeys to the station at Azizie, and taken thence to Smyrna by rail. The road from the mines to the station being very rough and over mountains, camels cannot be employed, a serious drawback, inasmuch as the carrying capacity of a mule is only equal to about one-ninth of a ton. The quantity of emery yet unmined in these quarries of the Gumnah Dagh is large, but the quality is below the standard. The Thyra mines, known as the Aliogoli, are located on a range of hills between Cosbunar and Thyra, within four and one-half hours by camel from Cosbunar to station on Ottoman railway, forty miles from Smyrna. They are operated by several parties under concessions from the Turkish Government, for a term of ninety-nine years. Formerly large quantities of excellent emery were taken out, but of late years it has become difficult to extract the ore, which is conveyed on the backs of donkeys to the plain. At the foot of this range of hills is the Coursak mine, a large, irregular bed of emery, not a lode, mixed with earth. It is easy of extraction, no powder being required, but is covered with from fifteen to twenty-five feet of silt, the accumulation of ages. Much of this inferior quality of stone finds a market in Germany and the United States. In all emery deposits there is a risk of a sudden exhanstion of the ore. This fact, taken in connection with the difficulty of procuring concessions, the peculiarities of Turkish laws, and the export duty of 20 per cent, calculated at the selling price in Europe, does not encourage enterprise in the direction of opening up new mines, or deepening old ones, although experience proves that the best emery comes from the greatest depths.

Failure of the Mine Indicator.

As might have been expected, the trial of the mine indicator in Nevada county proved it to be a fizzle. The Nevada *Tri-Weekly Herald*, of July 22d, says:

Over a hundred persons went out from town yesterday forenoon to witness a test of the mineral indicator that Dr. E. B. Lightbill, lately of New York, is endeavoring to introduce to the people of Nevada county. The test, or more properly tests, were made at the old Williams ranch, on Peck's ravine, not far from the Providence mine. We did not witness any of the experiments, but sent a reporter, whose opinion of the working of the machine is given elsewhere. The general opinion of those who were present while the tests were being made is that the indicator is a signal failure and a "hoodoo" of the worst kind. It would have pleased us very much had the indicator accomplished one-half what was claimed for it; but, from all accounts, it did not give the slightest demonstration that would argue in favor of its practicability. The manner of its introduction here convinced us that the apparatus would prove a failure. If the inventor and owners had full faith in the indicator they would have been apt to quietly buy up a few mining locations for themselves before giving a public exhibition of the machine by which it is claimed the whereabouts and richness of ore deposits can be determined. It is quite natural for the people of Nevada county to be skeptical regarding such matters. They have been fooled several times by mine indicators and new processes. The gigantic humbug known as the Fryer process has not yet been forgotten. Everybody hopes, and many believe, that the day will come when the exact location, extent and value of ledges can be determined from the surface by instruments, and when rebellious ores will be profitably worked. That day has not yet arrived.

A correspondent of the same paper gives further information on the subject as follows: In company with many of the scientific miners of this city, your correspondent visited the scene of the experiments which were yesterday made by Dr. Lightbill with what he calls a mine indicator. It is claimed that all mineral veins carry an electrical current, and that such current will communicate itself to the indicator and be demonstrated by the action of a galvanometer. We have not given the matter that attention which would warrant us in saying that the first of these propositions are true, but in our opinion, even if it is, nothing was demonstrated yesterday to prove either the first or the last. The experiments made were not of such a nature as would demonstrate the presence or absence of a mineral vein. Two bars of steel are driven into the ground about eight inches apart. These are connected to the poles of a battery and the endeavor was supposed to be made to take the current from the earth and indicate it by the needle. To our mind this was not done in any of yesterday's experiments. We came to the conclusion that the current passed from one of the electropodes to the other through the earth, and particularly so when they were placed in the wet soil, as the most rapid indications were made in the bed of the stream where there was plenty of water, which is a good conductor. On the contrary, when they were driven in the croppings of the Providence ledge, no indications whatever were received.

As we said, these experiments proved nothing as to whether there is a current in a vein, or as to whether that current could be successfully indicated by a machine. The wonders of electricity are but just beginning to be appreciated and every man who spends his time in experimenting is in danger of discovering something new. We believe in encouraging experiments in electricity to the fullest extent. It is a science in which men are groping in the dark and one of experiment. Some occasionally discover a new wonder in connection with it, and stranger things have already been shown than that a certain amount of it exists in a quartz vein which can be demonstrated by a machine. It is, though, we believe, one of the things which is yet to be discovered, and we would not like to rely on such experiments as were made yesterday if we desired to invest our money in mining. We should as yet prefer a stout, practical miner, with a pick and shovel, if we wanted to hunt for a quartz vein.

Tamping Drill-holes with Plaster of Paris.

The following paper was read before the American Institute of Mining Engineers, by Frank Firmstone, Easton, Pa.:

In the summer of 1881 we were forced to break up and remove the large mass of iron which had accumulated under No. 2 furnace at Glendon, in order to prepare the foundations of the new furnace which has taken its place.

We used "Atlas" powder, drilling the holes with a pair of Rand drills. These worked very well when the iron was at all uniform in hardness; but this was not often the case, and it frequently happened that the holes were hopelessly blocked when but little over a foot deep. Good tamping became, therefore, very important.

Tamping in the ordinary way holes having percussion caps in them is very dangerous, and has, no doubt, caused many of the accidents attributed directly to high explosives. We found an excellent and safe method by using plaster of Paris, mixed to the proper consistency and poured into the holes as soon as they were loaded. Clean dry sand was mixed with the plaster to reduce the quantity needed.

With proper attention the tamping would set in a few minutes, and little or more time was required than for tamping in the ordinary way.

We used a "magneto" machine (Laflin and Rand) to fire the holes; and an additional advantage in the plan was that at any risk of cutting the exploder-wires in tamping was avoided.

We found it worth while to load not over 13 inches deep in a block 3 or four feet thick, since the bottom of the hole was enlarged by each shot so that the next time it could be loaded more heavily, and three or four shots in this way often did as much good as a new hole twice the depth, to drill which might have taken ten or twelve hours.

The rise in temperature when boiled plaster solidifies is not sufficient to ignite the exploders, as we found by repeated trials before using it in a loaded hole.

Discussion.

S. Whinery, Meridian, Miss.: During the summer of 1878, while engaged on the improvement of the Tennessee river at Muscle Shoals, Ala., under Major W. R. King, U. S. Engineer, I had occasion to blast a large amount of limestone rock from the channel of the river. The surface of this rock was from one to three feet below the surface of the water, and the drill-holes were from one to three feet deep. The depth of water not being sufficient to make water-tamping entirely satisfactory, I experimented with several methods and substances for tamping under water. Among these, plaster of Paris was pretty thoroughly tried. When the charge of dynamite, with the platinum fuse, was in place at the bottom of the drill-hole, plaster of Paris, mixed quickly with sufficient water to make a rather thin mortar, was run into the drill-hole by means of a funnel and tin tube, the lower end of which was placed directly over the top of the drill-hole. The charge was allowed to stand 20 to 30 minutes for the plaster to set, when it was fired in the usual way by a dynamo-machine. This tamping gave very satisfactory results; but it was found difficult to have the plaster used properly and intelligently by the class of laborers employed, and the plaster would adhere and harden on the inside of the tube so as to fill and obstruct it in a short time. The advantage gained by this close and hard tamping, over the water-tamping, was not found to be sufficient to justify its use under the disadvantages named above, and it was discontinued. Where several hundred holes were to be drilled, charged and fired each day, in sets of from fifteen to twenty each, and any delay in charging and firing seriously delayed the whole work, the saving time, when the charge was simply sunk to the bottom of the hole, the wires connected, and the charge fired, was more than enough to compensate for the defective water tamping.

Dr. R. W. Raymond, N. Y. City: I would call attention in this connection to the fact that, although the rise in temperature in plaster of Paris he not sufficient to explode any of our highest explosives, there is an element of danger perhaps not peculiar to the use of this substance; and yet, in proportion as it is a perfect tamping, in that proportion this element of danger is present. It is not safe to leave any of the high explosives (at least those which are compounds of nitroglycerine), after tamping for any considerable period of time in such a confined position. A rise in temperature, which may not be enough of itself to cause explosion within a reasonable period, is often enough to set a generation of gas going which will bring the pressure, which will cause explosion. The thing to be done after tamping is to fire at once. My attention was called to this in the early days of the use of a nitroglycerine powder on the Pacific coast: I think the case is mentioned in my first report (1869) as United States Mining Commissioner. As I recollect it, a hole had been tamped in the mine just about the time to go to dinner, and the men having gone to dinner, leaving the hole with the exploder in it, but not lighted. It went off during their absence of itself, injuring nobody, but surprising them a good deal. They had the idea that dynamite was as safe as brown sugar, and among the miners the belief was, that in order to be safe, one had only to be careless with it, and leave it lying around loose. There was some truth in that maxim; but when you come to bottle it up, to pack it in a drill hole, and put tamping on top of it, it is then the elements of danger are present, and it is simply wise to fire it as soon as you possibly can.

At the same mine, where I examined it with some curiosity, they had a box of cartridges, which they had brought and unloaded at the mouth of the tunnel leading into the mine, and to which the men went and fished out a cartridge as they wanted it. This box lay for some hours, the first day after its arrival, under the rays of a California sun. Well, all that happened was, that slowly the lid of the box rose right up. Without question there was a generation of gases going on at the comparatively low temperature caused inside a wooden box by the sun outside—a generation of gases—which lifted the lid and relieved the pressure, so that there was no explosion. But rigid tamping of a drill-hole would make trouble I think if it should be abandoned too long.

William Kent, Jersey City, N. J.: I would suggest that, just before the tamping with plaster of Paris, some compressible substance be inserted, with the double object of preventing the conduction of heat and of making a compressible cushion, against which the gases could work, instead of confining them in a solid, close receptacle.

Dr. Raymond: I am inclined to think that that expedient would rather weaken the effect of the high explosive in particular cases, like the one cited in this paper, when it is designed to burst asunder salamanders of iron. In that case I suppose that any compressible substance making a cushion would enable the charge to lift more and lose tearing power, because there would be a yielding at the instant of the first impulse, before it came to act directly upon the rigid inclosure. I have no doubt that such a cushion would have the desired effect where tearing was not so much required as lifting, assimilating the effect of the explosion to that of gunpowder. I have no doubt that a safety-pad would be effective in counteracting the dangerous results of the generation of gases, and perhaps even increasing the force of powder; but at the same time I doubt whether it would do as good work in actually shattering solid rock.

William Kent: The space occupied by the gases generated before the explosion is so small (being but a few cubic inches to several thousand times as much), compared with the whole volume of the gases after the explosion, that I think the effect in lessening the force of the explosion would be imperceptible.

W. S. Ayers, Allamuchy, N. J.: I have found in limestone that a cushion did effect the tearing power of the powder; that the explosion did not shatter the stone as thoroughly as it did when the cushion was not used.

THE WEATHERING OF THE ROCKS.—A grand exhibition of one of the leveling processes of inanimate nature was witnessed in the vicinity of the Homer group of mines, south wall of upper Mill Creek Canyon, on Friday afternoon of last week. Jasper Parrett, who is doing some work on the Homer group, was climbing the wall by the Homer trail, and had just emerged from the narrow gorge through which the trail passes, about 1,700 feet up from the creek, when a great obtruding dyke of greenstone dropped from a heetling cliff nearly 2,000 feet above him, broke into huge blocks and come leaping and thundering down the nearly vertical declivity toward him. Mr. Parrett had barely time to escape over a field of compact snow clinging to the steep mountain side, and had the slide taken place while he was climbing through the steep and narrow gorge just below he must inevitably have been killed, as the flying mass raked both walls from end to end of the gorge. Some of the blocks, leaping several hundred feet down the mountain at a single jump, would strike upon a hard snow bank and hurl clouds of snow hundreds of feet into the air, and one block which weighed perhaps not less than one hundred tons, ran clear down into Mill Creek, a distance of about 5000 feet or nearly one mile.—*Homer Mining Index.*

METALS AND MINERALS.—The Carson *Index* says: The mineral surroundings of Mason and Smith's valleys are noticeable to every traveler. The hills and mountains are evidently more or less mineralized everywhere. No portions of Nevada more thoroughly present the united agricultural and mining resources of the State than are to be found in those regions. In the more barren portions of the plains, salt, borax and soda and alkaline earths predominate, and many an industry awaits the judicious application of labor and moderate capital. In the mountains there are metals, including copper, silver, gold, iron, nickel and galena. Right at hand are the great areas of rich soil with an average abundance of water for irrigation, which will furnish all the products for the sustenance of man and beast. The face of nature will in due time be retrieved of its native aridity and forbidding features by the teeming population that will drive the appliances of the farm and the mine. When this happy time arrives, the valleys of Nevada will be as prosperous as any upon the globe.

LAST year the Anaconda mine, at Butte, M. T., sold nearly $2,000,000 worth of copper, and will largely exceed that amount this year.

MECHANICAL PROGRESS.

Advantages and Success of the Gjers Soaking Pit.

At the May meeting of the Mining Engineers at Chicago, Mr. John Gjers, of Middlesboro, Eng., read a very interesting paper in relation to his now well known "Soaking-pit" process, an invention already fully described and often referred to in these columns.

Mr. Gjers characterized his invention as the missing link in the chain of metallurgical operations which began with Sir Henry Bessemer in 1857. Bessemer showed how it was possible to produce steel from the fluid cast iron without further direct heat. He stopped at the ingot. The soaking-pit dispensed with "puddling," and by the union of the two processes a rail is produced from the fluid cast iron without any application of external heat. In this country, where the general practice is to first roll the ingots into blooms 7 or 8 inches square, which are cut, heated and rolled into single length rails, the soaking-pit would only supersede the first heating, or that for rolling the ingots into blooms. If the heat in an ingot brought in a furnace to the temperature necessary to rolling be represented by 100, the heat in the fluid steel is 150; so that the steel can loose one-third of its heat in the ingot mold and sufficient remain for rolling purposes. One important distinction between furnace-heated ingots and those from the soaking-pit is that, whatever the surface heat of the latter may be, it is always hotter inside. The reverse is true of the former. The pits, with proper care, can be kept hot for ten days without difficulty when stoppages are necessary.

In addition to the saving of coal and labor in the use of the pits, there is quite a saving in the loss of steel. The loss of steel by absolute waste in the heating furnace varies in different works, but the loss in the first heating is seldom less than 2½ per cent in the ingot after it has left the blooming rolls, and 1½ in waste heating. Numerous experiments show that the loss from the ingot to blooms in the pits is ½ per cent, or a saving of 2 per cent. This may not hold true in this country, where the ingots are quite large, but the saving will be an important one. This saving is due to the fact that the ingot, while in the pit, is entirely excluded from the action of free oxygen. Not only do the covers exclude the air, but considerable gas exudes from the steel, and filling the pits, completely protects the ingot. This gas is composed entirely of hydrogen, nitrogen and carbonic acid, so that the ingots soak in a perfectly non-oxidizing atmosphere. The loss in rolling rails direct for ingots from the soaking pit is less than 1 per cent. The process has long since passed the experimental stage and is now in continuous operation in four Bessemer works in England, two of which roll off direct without any furnacing whatever. It is also about to be started in the largest open-hearth works in Scotland. It has also been in operation for some months at two large Bessemer steel works on the Continent of Europe, and is about to be started at another, as well as at an open-hearth plant.

Mr. Gjers states that at small open-hearth plants the process cannot be used to its full extent, but in a modified method it is still applicable to these also.

The paper was discussed by Dr. Raymond, Durfee, Kent, and others, which brought out several interesting facts. In case free oxygen should be present in the pits a lump of ore the size of a walnut or a small piece of wood was thrown in. The pits had been lined with steel and iron to prevent abrasion, but these linings were apt to buckle and the pits do not get quite so hot. Mr. Gjers proposed the fire-brick pits. If these were fitted with fire clay there was not much difficulty from abrasion. Pits have been continuously at work for 12 months.

Steel Plates by the Centrifugal Mode of Casting.

The English correspondent of the *American Manufacturer*, says that steel makers in England are just now paying some attention to what is going on at Leeds at a work there recently erected by Mr. Jos. Whitley. They have been built for the purpose of manufacturing, by what the inventor terms a wholly new centrifugal method, steel plates for shipbuilding steam boilers, etc. The method of procedure is briefly described as follows:

A hollow metal cylinder, lined with gannister or other brick, revolves at high speed, the axis being horizontal. A gutter or rhone, perforated with holes, passes into the interior along its whole depth. Into this gutter is poured melted mild steel, which, escaping through the holes, is carried round by the swiftly revolving case, and centrifugally is formed into an inner cylinder of steel about an inch or more in thickness. This cylinder, while still hot, is drawn out, cut across by a saw, put into a rolling mill and rolled to the length and thickness required.

Mr. Whitley, describing his own invention, says: Suppose I wish a plate for ship building; then, say, given a mold five feet in diameter, and five long; in it I cast a cylinder an inch thick. This when taken out and cut, is fully 15 feet long and five feet broad. It is then rolled down to half an inch of thickness. Such a plate is then 30 feet long and five feet broad, for we can arrange that the displacement of the thickness shall be chiefly endwise. The present mold is nine feet long, and five feet in diameter. With it I recently successfully cast a mild steel shell—weight of mold about 30 cwt. Continuing, Mr. Whitley puts it, this makes the long-looked for, but now no longer doubtful fact, an historic fact in metallurgical science.

Hitherto these plates have been made from large ingots, which have been burnt on the outside while getting heated to the center. It is the over-heated portion that gives way in collisions, boiler burstings, etc. In my process, continues the inventor, the whole plate is homogeneous throughout, and the tensile strength is so much increased that when ships collide there is no rending or fracture; and though the hilge is made to collapse, the ship, still floating, can sail into port to get re-bilged—recontoured.

Of course, tubes of smaller size can be manufactured centrifugally, and these are especially suitable for connections about steam boilers, where in lap welded tubes breakage is apt to take place at the overlap.

New and Useful Alloys.

It appears that the new alloy, known as "silveroid" is fast coming into practical use in Europe. It is being used for many purposes as a substitute for German silver. The distinctive qualities of the metal are that it is produced whiter, closer grained, capable of a higher polish, more suitable for casting purposes, and lower in price than any other alloy. It is also less disposed to tarnish, and is easily workable for all art castings and other purposes. It is much cheaper than German silver, besides being decidedly superior. For bicycle fittings and metallic ornamentation, generally, it is found especially applicable. It is used for railway and some other door handles, steam fittings and tubes; it is also taking the place of electro-plated work, as for knives, spoons, etc. The advantage claimed for it over the electroed goods is that the metal is cast solid and can be always kept in a highly polished state, whilst as an alloy it is more ductile than German silver. Screws are now being made of silveroid for use where there is exposure to corrosion.

Delta metal, composed of copper, zinc and iron, is also fast coming into use. It is claimed for this new alloy that repeated experiments have proved it to be equal in strength, ductility and toughness to mild steel. For sea-going purposes delta metal promises to be especially valuable as a substitution for steel plates in craft designed for the navigation of the waters of the African rivers which have the power of corroding and of eating through steel plates very rapidly. To test its value in this direction a London firm has constructed a steam launch of this alloy. The plates and angle pieces used are of the same dimensions as when steel is used. The launch is now one of the sights of the current exhibition at the Crystal Palace. Her length over all is 36 feet.

A NEW MECHANICAL PUDDLING FURNACE is claimed as one of the late achievements of English invention. The English correspondent of the *American Manufacturer* speaks of it as an improvement of Cort's puddling furnace, and a device for making the puddler (or boiler) no longer the drudge who handles the rabble bit, but the gentleman who watches automatically working machinery do all the labor required to turn crude iron into malleable iron, or into steely iron. It is more pretentious than the Dank furnace, says the above correspondent, since it proposes to ball-up as well as to boil. But whether it is likely to be attended with more success than that device is questionable. If it could be run as the inventor ventures to hope, then it would be a considerable improvement upon the Danks, since it would not only do more of the manual work, but would do it with a continuance scarcely contemplated by Danks; without, however, one would think, the capability of the Danks to treat heavy charges; though a series of rapidly perfect balls ought to be really heaten by the shingling hammer into massive blooms. But the device has not yet gone beyond the stage of models and plans.

HOW TO DETERMINE EXPANSION.—Mr. C. E. Emery made a very complete series of experiments some years ago upon the engines of the United States revenue cutters Rush, Dexter, Dallas, and Gallatin, from which he deduced the following simple rule (subject to certain limitation) for the best ratio of expansion in steam engines: Rule—Add 37 to the steam pressure as shown by the guage; divide the sum by 22; the quotient will he the proper ratio of expansion. Example: An engine is running with a pressure of 90 pounds per square inch; what would be the ratio of expansion? $90 + 37 = 127 \div 22 = 5.77$ = the best ratio of expansion.

IRON AND STEEL DIRECT FROM THE ORE.—There is said to be a fair prospect that Bull's direct process for the manufacturing iron and steel direct from the ore will soon be introduced into the Tees district, England. The direct production of iron and steel from the ore has long been one of the dreams of the Northern ironmasters, and some believe that by Bull's process they can effect it cheaply—even cheaper than pig iron can be produced under the present systems. This cheapness is claimed to be produced by the great increase in the yield of the furnaces, and the reduced consumption of fuel.

SCIENTIFIC PROGRESS.

The Zodiacal Light.

In the current volume of the Proceedings of the American Academy, Mr. Arthur Searle publishes an elaborate and exhaustive production of all the accessible observations of the zodiacal light, a phenomenon which is as yet but very imperfectly understood. The paper gives the position of the axis of the cone, and the apparent boundaries of the light, as determined by nearly 650 different observations by Jones, Heis, Lewis and others. The tables appended give monthly means and other data which summarize the results in a very complete manner.

Mr. Searle does not indulge in much theoretical discussion as to the nature of the zodiacal light, but he points out that the apparent slight deviation of the axis of the cone from the ecliptic is most probably due to the effect of atmospheric absorption, and calls attention to the necessity of more refined methods of observation. He says: "If atmospheric absorption has the importance here assigned to it in the study of the zodiacal light, we cannot expect to determine the true position of the light on any occasion by the simple methods heretofore in use. We must either discover exactly what an observer means by the boundary, and to what extent this boundary will be displaced by given changes of brightness, or we must resort to direct photometric observations. The last course will probably be preferable."

His only remark as to the theoretical explanation of the zodiacal light is the following: "I have merely to remark, with regard to the ordinary meteoric theory, that it gains greatly in simplicity if we dispense with all the imaginary meteoric bodies, or rings, with which it has usually been connected, and retain merely the conception of meteoric dust diffused throughout the solar system. It may be shown mathematically, if we regard the meteoric particles as solids reflecting light irregularly, that an appearance like the zodiacal cone, with an indefinite vertex, would result. On this subject the work of Geelmuyden may be consulted."

In regard to the last paragraph, *Science* comments as follows: We suppose that by "diffused throughout the solar system" he means diffused mainly in the plane of the ecliptic. Indeed, it could be shown that if we started with an indiscriminate spherical distribution of meteoric dust around the sun, the disturbing action of the planets would ultimately convert it into an approximately discoidal distribution in a plane coincident with the mean plane of their orbits. At any rate, it is not easy to see how an indiscriminate distribution should lead to anything but a glow-cone with a *vertical* axis.

ELEVATED OBSERVATORIES.—Some idea may be formed, which may be expected from the Lick Observatory, when all the instruments designed for that locality are in position from the following: "A new observatory has recently been established on a high mountain, in the south of France, known as Pic de Midi. Here Mr. Thollon has erected his most powerful spectroscope, and reports that he can see daily, forty rays of the chromosphere, in a region where ordinarily only eight are visible. He also makes the new and interesting observation that the granulations of the photosphere are visible in his spectroscope as fine strie extending through the whole length of the spectrum. What is yet more curious, similar granulations seem to show themselves in the chromosphere, being indicated by the character of the hydrogen lines, which are broken up into small pieces, instead of being continuous. It may be remarked, in this connection, that this observatory is not a purely governmental one, but has been constructed with the funds donated by various private individuals and scientific bodies of France." With improved instruments, equal elevation, and the much clearer atmosphere of California, still further new and still more interesting observatories may be expected from Mount Hamilton than has been or ever will be reported from Pic de Midi.

PHOTOGRAPHY IN ASTRONOMY.—Mr. Lockyer presents some striking ideas respecting the future of physical observations of the heavenly bodies. He suggests that it is now time to abolish the observer entirely, and that any astronomer would be losing his time by attempting to draw either the nebula of Orion or the spectra of stars. Photography should take the place of hand-drawing for both of these purposes. He pictures an astronomer, one thousand years hence, in a room filled with photographs, giving a picture of every part of the heavens, from pole to pole, as it appears to us in the nineteenth century. By using a different form of telescope, the expense of a dome could be avoided. Mr. Lockyer's suggestions are well worth the attention of those engaged in astronomical researches, or in planning observations therefor.

BIOLOGICAL RESEARCHES.—Professor Carnoy, of the Catholic University of Bouvain, announces a work on "Biologie cellulaire," which will treat of the general characters of cells, both animal and vegetable. He proposes to deal with the general organization, chemistry, and physiology of cells, basing his work upon original observations, either new, or confirmatory of previous researches. He promises over four hundred new illustrations, engraved with great care and accuracy. The scheme is ambitious; but, if well carried out, it will secure us a valuable book on an aspect of biology too little heeded at present. Professor Carnoy is a botanist, whose reputation will rise high if his volume fulfills the promises of the prospectus, says *Science*.

THE SALMON YIELD.—Mr. Huxley's report of last year's salmon fishing confirms his own assertion that very little is known about the influences which regulate salmon supply. The take of salmon and sea-trout has increased and diminished in defiance of all theories, and Mr. Huxley is equally unable to establish any consistent relation between the take of salmon and the proportion of grilse present in succeeding years, a large take being sometimes followed by scarcity, and sometimes by abundance of grilse. Mr. Huxley's sympathy with manufacturers has grown with his experience, and while he acknowledges the importance of the rivers, his confidence in the power of legislation has diminished with experience, but he still insists on the necessity of it. The two points brought out by the continued experiments of Mr. George Murray, of the British Museum, are that the fungus may attack fish with whole skins, and otherwise perfectly healthy, and that an excess of lime in the water is not a predisposing cause of the disease.

TEMPERATURE OF THE SPHEROIDAL STATE.—Prof. Louis Bell, of Dartmouth College, communicates to *Science* the particulars of some experiments which he has recently made to determine the temperature of the spheroidal state of liquids. The experiments were very carefully conducted and were simple in manner. The spheroids of the liquids experimented upon were produced in a spoon heated over a spirit lamp. A large number of experiments were made, the average variation of which did not exceed 1°. The size of the spheroids had no effect upon the temperature. The temperature thus found was: for water, 90°, and for alcohol 69°. We are not aware that any effort had previously been made to determine such temperature. The result of Prof. Bell's experiments show a much lower temperature than has hitherto been assigned to the spheroidal state, and they are both interesting and important.

INTERESTING PHOTOGRAPHIC DISCOVERY.—A German Scientific *Journal* reports an interesting and important discovery in photography. Eleven years ago, Professor Vogel, of Berlin, explained a method by which the effects of color, such as blue and yellow, might remain unchanged as to light and shade, and which might overcome this difficulty in photography. He has now worked out a process on this principle with practical success; it is published in the *Photographischen mittheilungen*, and the German Photographic Society has awarded him a prize for it.

THE SOURCE OF ELECTRICITY.—Physicists have lately been trying to determine by experiment whether the electricity of thunder-storms is generated by the evaporation of water or by the condensation of vapor. Freeman and Blake have each obtained results which indicate that no electricity is produced by the evaporation of pure water. S. Kalischer has since made some investigations with delicate apparatus, which have failed to show that condensation or the formation of hail is a source of atmospheric electricity.

THE LIGHT OF THE MILKY WAY.—Mr. Arthur Searle, in the course of his investigations into the phenomena connected with the zodiacal light, elsewhere referred to in these columns, has demonstrated the interesting fact that the Milky Way is about two magnitudes brighter than the mean brightness of the sky; which would mean, of course, that a square degree of the Milky Way gives between five and six times as much light as an average square degree of the rest of the sky.

A NEW AND IMPORTANT TEXT-BOOK FOR SCHOOLS.—Professor John Trowbridge, of Harvard University, has written a text-book for schools, which D. Appleton & Co. have in preparation. It is entitled, "The New Physics," and admirably carries out the principles of the new education, in requiring the pupil to become familiar with the properties of matter and the phenomena of force by performing experiments for himself. A work of this kind is much needed.

METEOROLOGICAL SOCIETY.—Steps have been taken in Boston to organize a New England Meteorological Society. The object in view is to advance meteorological science, with carefully and properly localized observations with regard to rain-fall, temperature, etc. Mr. Upton, recently of the U. S. Signal Service, but now professor of astronomy at Brown University, will act as director of observations.

MAN AND DOG. The dog is the only animal able to follow man as far and as high as he can go, but the finer breeds of dogs cannot long endure the conditions of a hight of more than 12,500 feet, and there are towns in the Andes at as great a hight as 13,500 or 14,000 ft.

SOLID ALCOHOL.—It is said that a Russian chemist has succeeded in solidifying alcohol at a temperature of 130° centigrade. It was transformed into a solid white body.

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Situation Wanted by Mining Engineer S. F.

See Advertising Columns.

Passing Events.

The announcement of new gold placers in British Columbia has created a local excitement only, most miners in California having had hard experience in British Columbia mining regions. Little is yet known of the new mines.

The prospect of building a big 80 stamp mill near Mono lake to work the low grade ores of Aurora is being discussed but as yet no definite steps have been taken towards carrying this out.

Some of the larger hydraulic mining companies are preparing to make the experiment of drifting their claims. There appears to be doubt as to the chance of profit, but a good fair trial will be made.

Several new quartz mines are about being started up in this State in different places.

Judging from telegraphic reports from the cholera infested region, the epidemic is being held in check pretty well. Measures are being taken on all hands to cleanse and purify in view of a possible visit from the disease. In this city sewers are to be overhauled, premises inspected, and a strict quarantine enforced.

Alaska Mines.

We had a conversation this week with a gentleman who has lately returned from Alaska, where he has been on some mining hueiness. He is not very favorably impressed with that country as a mining region. The climatic conditions are somewhat unfavorable, and there is not much mining going on. In a few places only are mines being worked.

Our informant visited Douglas Island, where there is a large body of low-grade quartz. They prospected this with a five-stamp mill, and are now engaged in getting out the lumber, etc., for a 120 stamp mill, which is being made in this city. The ore will only run about $6 per ton, with a good deal of sulphurets and very little free gold. The surface was richer, but the placer miners washed this off. They have water for about eight months of the year at this place, and the rest of the time everything is frozen up. The mill will be run by water-power. A good company has hold of the mine. The ledge is a wonderfully wide one, and nearly all solid. A tunnel was run, showing the ledge to be 490 feet wide, nearly all quartz. There are one or two other deposits of quartz on the island, not so large. They are all undeveloped, and their owners hold them at very high figures. One party went up this season, taking machinery to work claims, and intending to buy. Prices were so high, however, they thought they could get better mines for less money in California, so returned, bringing the machinery back with them.

At Juneau and Harrisburg, opposite Douglas Island, the placers are paying well on a moderate scale. Half a dozen different parties are at work. There are very few white men, and with all the Indians there are only about 200 or 300 men in Harrisburg. Our informant thinks two or three years will see these mines worked out. The deposits are up on the hillsides. The men work them by sluices. They get about $6 per day, nothing under $4 ground being touched.

There is a good deal of rich float in places but no ledges or deposits of quartz were found by the party of which our informant was one. He is of the opinion that there are not more than 250 or 300 white men in the whole territory, though a much larger white population is claimed. He visited Wrangell, where there are only 40 white men. Outside of Sitka and Harrisburg there are very few white men, and not many live at these places. At Harrisburg there are about 100 white men mining. They have plenty of water for five months of the year when the ice melts, but the rest of the time everything is frozen up.

In this connection the opinion of Mr. Ed. Schieffelin, the veteran prospector, who last year went 1,200 miles up the Yukon river prospecting, may be quoted: Mr. Schieffelin has been a prospector from his youth, first starting out at this business at the age of 14 in Oregon, and for the last fifteen years he has explored this western coast. He says: "Alaska will never amount to anything. The surface of the land is completely covered with moss as is this floor with carpet." He thinks the land is always frozen, and Alaska is good for nothing but fish and fur. There is gold there, he says, almost everywhere, but not in big paying quantities.

THE attention of manufacturers and merchants has been called to the Universal Exposition to be opened at Antwerp, May 2, 1885. The Belgian Consul, Wilfred B. Chapman, has a circular with reference to the project. It has received the approbation of the Belgian Government, and every effort will be made to assure its success. Merchants, manufacturers or others on this coast who may desire to have further information with regard to the conditions under which this exposition will be held, are cordially invited to examine, at the Belgian Consulate, documents that have been prepared for that effect by the Executive Committee. The Consul will be pleased to forward to any one desirous of participating a form of application for admission. Said application must be addressed to the Executive Committee in Antwerp not later than the 1st of September next.

FOLLOWING is a list of the placer canons of Los Angeles county: San Antonia, Palomas, Sierra Pelon, Placcrito, Mayo, San Gabriel, Santa Feliciana, San Francisquito and the Piru, the oldest gold bearing canon in the State which is located in Ventura county, but which rises in Los Angeles county.

The Geological Survey.

The U. S. Geological Survey has in this State a party under Prof. Becker, which has been for the past year making scientific inquiry into our quickeilver deposits. For several months the party were at work in Lake and Sonoma counties, and only lately returned from a trip of several months' duration around the New Idria mines. Last week they left to examine some quicksilver and coal fields in Contra Costa county.

The Geological Survey is now engaged in work of a more practical nature than was the case some years since. At that time they were doing reconnaisance work in Colorado, Montana, Wyoming and Utah, mapping out the general geology, and giving general descriptions of comparatively unknown regions. Much of the information collected is of great value, of course, though there was not much material of interest to the practical miner.

Of late, however, the parties have been working in mining districts where developments have been made, and recording results. They have had opportunities of getting underground and studying up the subjects of deposits, ledges, veins, etc. The maps and descriptions form useful guides to miners in other localities where similar formations exist. Some of the recent publications of the survey are specially valuable. That on "Mineral Statistics," particularly, edited by Albert Williams, Jr., is probably the most useful work to miners the Government ever issued, containing as it does information concerning the various mineral substances being mined in the United States, the extent, locality, value, etc. Another volume on the same subject will be issued the coming year. It treats of substances outside of the precious metals, such as manganese, salt, graphite, mica, lead, coal, iron, copper, asbestos, etc. The work now being done here by Prof. Baker's party is very valuable, and the publication of results cannot fail to be of great interest to California miners.

Foundry Notes.

At the Goss & Dow steam pump works they are building a pump with a capacity of half a million gallons a day for a new water company at South San Francisco. If the residents patronize this new company as expected, larger works will be erected next season. A large reservoir has already been built.

The Pacific Iron Works last week cast a very large mustard press for Kindler & Co.

The first large boiler made at the new shops of the Union Iron Works, in the Potrero, was shipped on Wednesday last. The first ship to lay alongside the docks went to the slip to take on the large boiler. The boiler is 12 feet in diameter, made of seven-eighths inch steel plates, and weighs 42 tons. It was made for Pope & Talbot, and will be put on one of the firm's tugs at Port Ludlow, to which place the *Comet* will carry it. The main buildings of the works are finished, and the massive machinery is being put in. A portion of the works are busy, and some 300 men are at work on boilers, machinery and other articles. A frame ship house is being put up at the water's edge, in which will be built hereafter the iron ships for which the works are mainly destined. This building alone covers 50x300 feet, and is furnished with all the necessary machinery for drilling, bending and shaping plates.

At the Risdon Iron Works a large force of men are at work on the twenty-seven miles of pipe for the Spring Valley Water Co., to which we have before referred. The Risdon Co. will finish this month the 120-stamp mill for the Alaska Mining Co., whose mines are on Douglas island, Alaska. Reference is made to these mines in another column.

THE ninth annual convention of the Amalgamated Associations, August 5th, will be one of the most important conventions in the history of the Associations. Measures will be decided upon that may stir up decidedly lively actions in the labor world. They contemplate the thorough establishment of the Association, and the adoption of a vigorous policy West and South.

THE trade opened up with Mexico by the new railroad to the City of Mexico is chiefly profitable to San Francisco merchants in the demand for canned salmon and fruits, green fruits, wine and powder, candles and quicksilver, for all of which there is considerable demand.

New Ore Concentrator.

Frederick Morris, of this city, has just patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, an improved ore concentrating apparatus. It consists in means for separating the precious particles from the sulphurets or other material with which it is mechanically united, concentrating them and running off the other material by one or more successive operations over an apparatus prepared for the purpose, so that the concentrates thus obtained may be amalgamated, or otherwise treated, without the presence of a large quantity of worthless material which fouls and carries off the mercury, and interferes with the amalgamation.

This concentration is effected upon one or more perfectly plane tables having the surface slightly inclined from one end to the other, and sub-divided into narrow channels, the bottoms of which are covered with blanket, canvas or other fibrous material, in which the heavier particles of precious metal will be retained, while the worthless material will pass off, these channels being supplied with transverse troughs with regulating plates for each channel. Washing tanks are placed between the successive series of channels, so that the fibrous bottoms of the channels, when filled with concentrates, may be washed out, the concentrates allowed to settle, and the muddy water siphoned or drawn off, and a fresh supply of pure water added before they pass through the second series of channels.

It has always been customary to crush precious metal ore to a certain degree of fineness, and amalgamate in the battery, the whole of the material being taken to the amalgamating pans or other apparatus to be treated in bulk, the waste material not being run off until all the operations are completed. If there are sulphurets in any great quantity associated with the precious metal, they are frequently concentrated out by tables, riffles, or other apparatus, and afterward treated independently by chlorination or other process. The union of the gold in the working of ore, to which Mr. Morris' invention particularly applies, is not a chemical union, but only a mechanical one, similar to its union with the earth or rock, except that the gold is much finer and cannot be separated without being crushed finer. In this invention the ore, rock, sulphurets or other auriferous material being crushed very fine, is passed through the apparatus, where the gold is settled and retained in the fibrous bottoms of the channels with but little foreign matter, and when finally amalgamated the process is not hindered or the mercury fouled by the large quantity of worthless material by which the bullion obtained by the usual processes is often rendered nearly worthless.

Another Northern Gold Field.

There has been a great deal of gold taken out of the mines of British Columbia, since precious metal was first discovered there. The quartz mines never have amounted to much, but some very rich placers have been found and worked in various places. Two or three of the early "excitements" carried thousands of men from the California mines with disastrous results to most of them. The Fraser river excitement is remembered as one of the most widely spread the miners ever experienced. Thousands went to the region, but few made fortunes. Every few years new regions are discovered, but they are generally circumscribed in extent, and the ground usually taken up. The climate is against mining, for the winters are long and severe, and the country rugged and mountainous with innumerable streams. The mosquitoes in some places are enough to keep men away. This week the telegraph brought us news of another find, which has raised a local excitement at Victoria. On Lone Creek, a tributary to the Skeena river, 800 miles above Aberdeen, a man known as Jerry took out $600 in less than two days. On Lost Gulch, a short distance above Lone Creek, Harry McDame and J. O'Brien took out $1,300 in three hours, crevicing one piece that weighed $87, and was exhibited at the Skeena mouth. The gulch is fifteen miles long. Crowds have left the canneries for the new gold field, and many more would have gone but for the scarcity of mining implements and provisions. Mr. Cunningham has brought $1,200 in coarse gold from Lone Creek, taken in trade. The pieces range from the size of a bean to a pigeon's egg. Every one on the Skeena is jubilant at the discovery of gold.

The California Wire Works.

We present our readers with a double sheet lithograph of the shops and factories of the California Wire Works, whose property occupies the entire block, bounded by Bay, Powell, North Point and Mason streets, about 2 6-10 acres—it is the prominent feature of North Beach and can be observed very plainly from the decks of steamers entering the harbor. All the ground has been reclaimed from the bay, and has been filled in to the height of 22 feet above the bed of the salt water.

The general arrangement of the works can be seen by reference to the plan, and includes wire mill, galvanizing works, wire rope factory, barbed wire factory, wire works, wire weaving shops, machines and fittings, foundry, carpenters' and pattern making shops, store-rooms, warehouses etc.

The engine room is an excellent sample of what such a room should be; the main engine is a 300 h. p. Corliss engine, with a Deane condenser; there are two auxiliary engines of 35 and 15 h. p. respectively.

The wire mill has a capacity for turning out 3000 tons of wire per annum: it has been making on an average 7 tons per day.

The rope factory has turned out some very large wire rope and cables, and supplies most of the street railroads in this city.

The works are fitted for manufacturing wire, and everything from wire, as well as railings, gates, fences, etc., of wrought iron.

The Company has expended $680,000 in real estate, construction and equipment, and in raw and manufactured material. The stock-holders are among the most substantial men in town, and the enterprise is of great importance to this State. At the time of the completion of these works we published a detailed description in the MINING AND SCIENTIFIC PRESS, so the following facts in connection with the drawings will give a good idea of this flourishing home industry:

The California Wire Works bought the property in September, 1882, and in October commenced to build the foundations for their warehouses and factories. All the foundations are of concrete, of which there are over 50,000 cubic feet. The ground here has been filled in to the depth of 20 feet, below which is the bay sand and mud.

The consumption of water for the use of the wire mill is very great. In order to provide an ample supply, two artesian wells were sunk, and a satisfactory amount of water secured at about 100 feet. A beautifully working pump, made by Goss & Dow, is used for pumping the water to a tank containing 20,000 gallons, placed on a tower 60 feet above the ground.

In providing the foundation for the chimney, which is 100 feet high above its foundation and 11 feet 10 inches square at its base, a concrete foundation was provided, 16 feet square by 6 feet in depth, on which the brick chimney was erected.

There are four boilers, each 16 feet by 54 inches, with 54 3½-inch tubes each, with ornamental fronts, and fitted with smoke-consuming apparatus and all the most recent improvements. The building is 45x35, entirely fireproof, being of brick and iron.

Engine Room.

A horizontal Corliss engine, 24x48 inches, made by Hinckley, Spier & Hayes, of this city, is bedded on a heavy concrete foundation, and works smoothly and with great regularity. It is nicely finished and well proportioned, and reflects credit on the builders. The fly-wheel is 18 feet diameter and weighs 23,000 pounds. The driving pulley is 10 feet diameter by 50 inches face, and drives a ponderous treble leathern belt, 4 feet wide and 80 feet long. This is the largest leather belt ever made on the Pacific coast. It runs perfectly true, transmitting 300 horse-power with apparent ease and grace. Mr. H. B. Cook, the manufacturer, states that it took 56 hides to make it, and weighs 938 pounds.

The engine is surrounded by a handsome wire railing, to keep visitors out of danger, and the engine room, which is 30 by 45 feet, is finished off in natural wood, varnished. It is well lighted, as clean as a parlor, and is perhaps the most tastefully finished engine room on the Pacific coast, if not in the United States.

The engine is set up 10 feet above the floor, which, as well as the walls, is built of concrete. On the floor are the condenser and pump used in pumping the sea water from the bay beyond the sea-wall, where it is clean and pure, to the heater in the engine room, where it serves the double purpose of condensing the exhaust steam and supplying the new salt water swimming baths with hot salt water.

Machine Shop.

The machine shop is 45x100 feet. It is well equipped with a great variety of lathes, planers, shapers, drilling machines, bolt cutters, etc. In the blacksmith shop are the fires and forges, where much of the heavy railing-work made by the company is done.

The carpenter and pattern-makers' shops are immediately over the machine shop, and adjoining the latter is the pattern room, fitted up with shelving full of patterns, these together occupying a space of 45x120 feet.

Wire-working Department.

Passing over a bridge, the visitor enters the wire-working and wire-weaving departments. The former occupy a room 40x215 feet, and the latter a room 19x90 feet. Here wire is worked up into every conceivable shape—massive gates and guards for prisoners and insane asylums, and delicate flower-baskets for a lady's conservatory; large summer-houses and aviaries, and small mouse traps and trap cages—every conceivable kind of ornamental garden work, fire feaders and floral designs.

Wrought and cast-iron railing is being made a specialty, and there are here a great variety of special tools employed in the manufacture of railing. Many of the designs are entirely new, while others are taken from samples of work done in the 15th or 16th century.

The wire and iron-working department gives employment to a great many boys, who are learning a trade at which they will be able to earn a good living. In an adjoining room are a quantity of looms used in weaving all kinds of wire cloth.

Wire Rope Factory.

In the flat-rope sewing department are manufactured the long, massive flat wire ropes used for hoisting ore from the deep mines. The manufacture of flat rope requires great care, in order to secure uniformity of strain on each of the strands and make the rope run straight and even.

The main rope factory, where the wire is spun into strands and the strands into rope, occupies a building 275 feet long by 40 feet wide, and is filled with very ingenious and somewhat noisy machinery, all of which is the invention of Mr. A. S. Hallidie or his brother.

Great attention has been paid to the manufacture of wire cables for street railway. Mr. Hallidie naturally watches with a jealous eye all such ropes, being naturally anxious that the success of his invention of cable railways should not be impaired by imperfect cables.

Barbed wire-fence making is carried on in an adjacent building, and we were shown the *modus operandi*. They have facilities for making fifty tons per month.

Wire Mill.

All the different branches of manufacture of the California Wire Works, as well as the demand from outside sources, are supplied with wire from the wire mills of the company, which are situated adjacent to the other works; and they have been constructed with the utmost care. All the wire is drawn cold, through steel dies having holes in them of the proper size and form needed for the purpose, and in order to fit the solid iron rod for drawing down, it has to be carefully annealed; and afterward all the oxide and scale are removed by acids. The rod is then covered with a gelatinous coating, and is ready for the wire drawer. The machinery is very massive, the driving shaft being six inches diameter. There are eight different trains of revolving blocks used for drawing wire, containing 236 blocks, and the capacity of the mill is 400 tons per month. All sizes of wire are made, from ⅜ inch to 1-140 inch thick. The wire made at these mills is principally from Bessemer and Siemen-Martin steel, although a great deal of Swedish wire is also drawn. The tempering and annealing is done in furnaces specially built for the purpose, of the most approved plan; and after the wire is cleaned with acid, the acid has to be all evaporated from the wire, which is done in a drying and baking house of brick. All the lifting of the wire and rods is done by hydraulic cranes, and every thing is provided that modern practice permits, to save labor.

The general design of the works was made with a view to compactness, and completeness, and the engineering details and designing has been done by the company's engineer and draftsman, Mr. A. Grutter, in a manner eminently satisfactory to the Board of Directors.

Galvanizing works have been erected on the company's property on North Point street, for the purpose of galvanizing much of the wire produced at the company's mill, and a foundry has been constructed on the Powell street side of the property.

Warehouse.

The large fireproof warehouse of the company occupies almost the entire length of Mason street between Bay and North Point streets. It is 235 feet long by 40 wide, two stories, built of brick and iron.

This one of the leading and profitable industries of the Pacific Coast, furnishes employment to 150 men, many of whom earn as high as $30 per week at piecework.

Testing Room.

Before any wire is put into the hoisting rope or railroad cable, it is very carefully tested for tensile strength, torsion and bending, and in a room set apart specially for the purpose there are machines and apparatus specially made for the purpose.

The provisions against damage by fire are very complete. Four-inch mains run all around and through the grounds. There are six fresh water and six salt water hydrants in convenient locations. A tank of 20,000 gallons supplies the fresh water pipes, and from the four mains smaller pipes are run throughout the works, and have fire-cocks and hose always ready for use. The salt water supply is taken from the bay by means of a ten-inch main and a very heavy fire pump.

Copper Smelting Furnaces.

Till recently, the German cupola practice was invariably followed in the cupola smelting of sulphureted copper ores. The German furnace consists of a brick shaft, three by four feet, or four by five feet at the tuyeres, which are generally inserted at the back. The crucible is either closed, as in crucible furnaces, or is a sump or basin, in which the matte collects. It extends in front, beyond the shaft, and is divided by a wall dipping below the surface of the slag, as in the sump-furnaces, or the crucible is provided with two tap-holes, which discharge both metal and slag into basins outside the furnace, in which the separation is effected.

The channel furnace, with two eyes, a German brick furnace, smelts ten tons daily, and the length of the campaign seldom exceeds a fortnight, when the shaft must be relined, and the sump or basin retamped with brasque.

American metallurgists, untrammeled by precedent, have made great improvements in cupola construction and practice. Cupolas with circular tuyeres, or with six tuyeres surrounding a high jacketed furnace, or magnified Rachette furnaces, are the forms in general use in this country. The sump of the old German furnace has grown into a well, detached from the furnace, into which the products of fusion flow continuously. Mr. James Douglas, in a chapter of a Government Report, in speaking of copper smelting in the United States, states that neither the water-jacket nor the well can lay claim to be American inventions. Notwithstanding this statement, the fact remains that the water-jacket furnaces, as made and improved on this coast, have entirely superseded most of the other styles. Mr. Douglas asserts that Mr. John Williams, since well known in this country, built, in 1852, at Drontheim, Norway, sectional water-jacket furnaces, consisting of a circle of long, narrow water-backs, perforated by tuyere holes. In these furnaces he also used the germ of the modern outside well, by flowing the entire charge continuously from the furnace through an aperture into an outer sump. Water furnaces were long used at Pont Gibaud, France, and introduced from there by Mr. Rickard into the Richmond Co.'s works of Eureka, Nev.

In 1873, water-jacket smelters were put up at the Winnamuck, the Williams and the Flagstaff in Utah, on lead, and at the Copperopolis mine, on copper carbonate. Mr. Douglas states that the present familiar type of water-jacket was planned and first used at the Blue Bell mine by Mr. Lewis Williams. To the Oxford company he gives the credit of designing and using most successfully a well with a partition extending from side to side and reaching from the top to some distance beneath the surface of the clay.

Marking Patented Articles.

It ought to be pretty well known among patentees by this time, that they must mark their articles patented, if they expect to recover damages from people infringing. The U. S. Statutes require this. If they are not so marked, and people manufacturing are notified that the article is patented, damages can only be recovered, which might accrue after this formal notice is served. A case involving this question was decided by the U. S. Circuit Court in this city last week. About eighteen years ago, Horatio Allen, the President of the Novelty Iron Works, of New York, obtained letters patent for an invention, known as "Allen's patent packing." He made and vended the article until the patent expired, but never affixed to it a "patent mark," as required by the Act of Congress. This omission led the public, especially in this city, to believe that the article was not patented, and for many years it was used extensively here by manufacturers of steam engines, without suspicion that they were invading any person's rights. In August, 1875, W. W. Hanscom, acting as agent of Allen, notified parties in this city, that they were using a patented invention. Afterward, Allen brought suits against William Deacon, Rankin, Brayton & Co., the Ætna Iron Works and several other parties to recover large sums for infringements, extending over a series of years.

The case against Deacon was selected as a test. The defense was that the statutory notice had not been given, and that the defendant did not know of the existence of the patent, until notified by Hanscom; that after receiving notice, he used only enough of the packing to finish an engine he was then constructing, and that before the suit was brought he had offered to pay for all he had used, at the price customarily charged by Allen, which in this case amounted to $126.55. Judge Sawyer, in his decision, holds that the statute requiring notice must be observed, and that as it was not complied with, and as Deacon had no knowledge of the patent until notified by Hanscom, he was obliged to pay for such infringement only, as occurred after notice. This decision renders Allen's recovery merely nominal, and saves the parties sued the judgment of large amounts.

Better Facilities in the Patent Office.

For many months past there has been great complaint among the inventors of the country and those having transactions with the U. S. Patent Office, of the great delay in the business of the office. In all the rooms they have been so overcrowded with work, that cases would have to lie two, three or four months before they were considered. The Commissioner himself called the attention of Congress to this matter, and statements were prepared and submitted by the different examiners showing the number of cases pending, the length of time since received, etc. Each one required more assistance to get his work done promptly. As we have before stated the Patent Department pays the Government a handsome profit above expenses, all of which money comes out of the pockets of the inventors. It seems strange therefore that their business should be delayed owing to lack of force to carry it on. Even now there are hundreds of cases pending which have been filed three or four months.

It seems that the numerous complaints have had an effect. About two weeks ago there were 106 promotions in its Patent office, preparatory to a large increase of the clerical force. The rooms formerly occupied by a part of the Census Bureau have been leased by the Interior Department, and will be occupied by the Indian Bureau. The twelve or fifteen rooms in the Interior Department thus vacated will be placed at the disposal of the Commissioner of Patents to accomodate his increased clerical force. The Commissioner believes that the office will soon be able to dispose of the accumulated patent business, and to keep up hereafter the current business of the office. Three new divisions will be created, the character of which is not yet determined. A board of experts is now making investigation with a view to ascertain how far the business of the different bureaus is in arrears, and to recommend such corrective measures as in their judgement will faciliate the public business.

THE sum of $1,250,000 is given as a safe and conservative estimate of the monthly product of the Butte district, Montana.

Hoisting Ropes and Their Attachment to the Cage.

Among other papers, the journal of the British Society of Mining Students, contains an able and exhaustive article on colliery winding ropes and their attachments to the cage, in which the materials from which the ropes of the hemp class are manufactured are first described; and the nature of combination ropes of Russian and Manilla hemp, which are found in the writer's experience to last twice as long as ordinary Russian hemp ropes, is discussed. As mines increased in depth hemp became unavailable, as to 240 to 300 fathoms of its length is equal in weight to its working load; and iron wire ropes were introduced into the Hartz in 1830, but not into this country till ten years later. But an iron wire rope is strained to its working load with 435 fathoms of its own length, so something stronger was required for such mines as Ashton, near Manchester, which is 448 fathoms deep, and in 1860 steel was introduced in the manufacture of ropes and has been gradually increased in tenacity, until now plough steel has a breaking strain of 120 tons per square inch. For great depths ropes are lightened by making them tapered, and in this paper the taper ropes employed in the Adelbert silver mine in Bohemia (612 fathoms deep) are described. They consist of 36 wires manufactured from steel having a tenacity of 72 tons per square inch, the taper being given to the rope by reducing the gauge of the wires from .103 inch diameter at the drum end to .075 inch at the cage. It appears that these ropes can now be manufactured almost as easily as the ordinary kind.

The construction of ropes is next dealt with; the hawser, shroud, and cable laid forms of hemp ropes are described; and then the original selvage rope which consists of a bundle of iron wire laid parallel and bound together; and the laid and compound forms of wire rope in use at the present day. Among the latter forms of ropes are mentioned Lang's patent, in which the wires and strands are both twisted in the same direction, thus giving a much longer surface of wire exposed to friction which lessens the risk of individual wires breaking at the crown of the strands; and also a new form of rope made in Switzerland in which coarse cotton yarn is spun about the separate wires so that a soft bed is obtained between them and soft rest for the whole rope; this rope is said to be very durable, and not liable to rust. The author does not approve of wire centers which are liable to break when the rope stretches; hemp centers on the other hand stretch with the rope and allow the strands to bed themselves solidly. He gives short empirical rules for finding the weight and strength of ropes, and shows that the strength may also be calculated in a rational manner from the sectional area of the wires and the tenacity of the material of which they are composed, and deducting one-eighth for the loss of strength due to the lay.

In dealing with the duration of ropes he recites some good practice, viz.:—The size of drums should be ten feet in diameter for a rope one inch in circumference, adding six inches to the diameter for every additional one-fourth inch in circumference; pulleys should be the same size. The incline portion of rope, from pulley to drum, should make an angle of less than 45 degrees with the rope in the pit, and it should never deviate further from the plane of the pulley than one-fiftieth of the distance between the pulley and drum shafts. Ropes should not be shifted from one drum to another even although larger, and there is no saving in turning them end for end. Excessive wear of that part of the rope which is over the pulley when moving the cage at bank should be avoided by re-capping which at some collieries is done every six months.

Roughly, he finds iron ropes to last one year, crucible steel 1½ years, patent steel 2 years, and plough steel ropes 2½ years. A table is given showing all the details of several ropes, the number of months they lasted and the tons of coal drawn, from which it appears that the cost per ton for winding ropes varied from .07d. to .30d. per ton.

Treating of the connections of the rope to the cage, the writer remarks that the working parts of detaching hook are liable to rust together, especially those composed of plates, and that it is desirable to keep a spare one and overhaul them every three months.

The capping of ropes is elaborately entered into, and tables of experimental results are given which are very suggestive. The hooped form gives the best results, and even these on a rope having a breaking strain of 60 tons had the rope drawn from 2 inches to 2¾ inches out of them with a strain of 25 tons. In three of the experiments, the rope broke inside the cap with a strain of from 44½ to 49 tons, showing that the cap or hose is the weakest part.

THE OLDEST MINERS' UNION.—The Miners' Unions of Germany are the oldest associations of ths kind iu the world, having originated in ths silver mines of the Hartz Mountains more than 600 years ago.

MINING NEAR WASHOE CITY.—The parties who hold a United States patent for a number of galena mines west of Washoe City will commence the work of developing the property some time this month.

Mining.

"Industrial progress, if I may be pardoned for the expression, goes by steam, and as the needs of man may be said to expand indefinitely, there is an immense field for the employment of the precious metals."—*Victor Bonnet, October 15, 1868.*

As the years roll on, the foregoing becomes more and more a pertinent fact to thinkiug men. It is one of Nature's penalties that riches never satisfy men. The more they accumulate the more they want, and the more they have the sharper becomes their invention of ways to ostentatiously display it. Cunning artisans, knowing this, are struggling, perpetually, to fashion works of art which shall minister to the pride of the vulgar, and charm the tastes of the refined. More and more these artisans lean upon the precious metals for material on which to work, until now they absorb a heavy percentage of their product. At the same time the trade of the world is expanding so tremendously that the call for increased quantities of gold and silver to serve as a measure of values is steady. We have made the foregoing as a preface to say that while the financial centers of the East are fearfully shaken, while there are apprehensions that there will be difficulty in disposing of the harvests advantageously; while the shrewdest business men are slowly reaching the conviction that hard times for three or four years will be the rule, there should be neither apprehension nor nervousness in this region, because around us is plenty of material which hard times does not affect; which since the days of Abraham has been to mankind what the Polar Star is to the night. But while mines are here in abundance —mines that with reasonable expenditures would return certain fortunes to their owners—there is not a proper effort being made to place them in producing form. To make that effort there should be a combination made among the leading mining men in this region. By putting two or three enterprises in the proper form, we believe that with the backing of good men here any needed amount of money might be obtained in the East to prosecute developments and to erect reduction works. Just now the men who have some money left—and there are millions of them—are not anxious to purchase railroad stocks or bonds, and if we mistake not a good many of them are remembering with grief that in the railroad stocks which everybody was anxious two years ago to dabble, more money has been lost in a single month of this year than all the money the East has ever lost in mines amounts to. Such men are in a condition now to listen to reason, and could the effort be made to obtain just enough money to complete necessary work and get properties on a paying basis, it might be done; for the feeling in the East now is, we imagine, very much like that experienced by a rat when he, after a careful survey of a ship, makes up his mind that the proper thing to do is to go ashore. There is one fact which men here do not appreciate at its full value, which is, that there is no other occupation in this region half so legitimate as mining. Farming is good, merchandizing is all right—there are a thousand honorable occupations—but here all else leans on the great industry of mining, and from the first on this coast the pulse of business has been quickened or retarded in exact proportion to the yield of the mines. With the surroundings which Salt Lake has it is wicked that hard times should ever be known here.—*Salt Lake Tribune.*

Clifton.

A correspondent of the Globe (Arizona) *Chronicle* says:

At last Clifton is fairly upon the road to prosperity. The Arizona Copper Company have been running three stacks in their immense smelter plant at this place for over a week. They employ about sixty men about the furnaces, and will shortly be obliged to put a largely increased force to work in their mines, as they are now smelting about 200 tons of ore per day, and the entire reserve of extracted ore at the respective mines will not exceed 15,000 tons—only a little over two months' supply for the present smelting capacity. The company has two thirty-ton Rankin and Brayton jackets all ready to blow in, and will probably add them to their present number of working furnaces during the coming week. The output of bullion has been estimated in value at $5,000 per day since starting. This will, of course, be considerably increased when the other two smelters are blown in.

The company's twenty-inch guage railroad from the smelters to the numerous mines owned by this company is kept running all the time to its fullest capacity, bringing down ores for reduction. At present they are using but one of their three small locomotives, but it is intended to put on one and perhaps both of the others, thus increasing the capacity of the little railway.

The machinery at the company's reduction works is being run by water power, of which there is a great plenty for all practical uses; but in case of a failure in the water, works are provided with a Corliss compound engine, etc., which can be used in place of the water power.

The narrow guage railroad from Lordsburg, also the property of the Arizona Copper Company is doing a good paying business, running one train each way per day.

The Detroit Copper Company, Wm. Church, president and superintendent are about to move their furnaces from the Frisco River, where they are now located, to their mines, about nine miles distant, where they will be run by steam power instead of water, as at present. This company have laid a pipe line from the river to the new smelter site, and the water necessary for their use will be forced from the river, using their old water power for that purpose. Their various mines will be connected with the smelters by a system of inclines and tramways, doing away with all manual labor in the handling of their ores after they leave the mine.

Sulphur Deposits.

Mr. D. M. Jewett, writes from White Oak, N. M. to the *Mining Review* about the discovery of sulphur deposits in Tom Green county, Texas. He thinks there is no question that the deposits would pay great profits, but for the disinclination of capitalists to embark in mining in new localities, he doubts whether these Texas deposits will be for many years of any practical importance.

It has been known for many years that there existed in America sulphur deposits exceeding in value and importance all those of the Island of Sicily, and still we have imported our sulphur and let our own deposits be unworked. In the parish (county) of Calcasieu, in my own State of Louisiana, not far from Lake Charles, and precisely under the track of the N. O. and Texas Ry., there is a deposit of sulphur purer than the usual "refined article of commerce" which has been known for more than twenty-five years. The bed reaches in places a thickness of 109 feet, and never, I believe is less than 98. From 90 to 98 feet of this is commercially pure sulphur. The borings made from 1869 to 1871 extended over some 2,500 acres, and the bed was reached at an average depth of 428 feet. It lies under a perfectly level country, fuel and timber are near and abundant, labor cheap, transportation on the ground and connection perfect with the railway system of the continent, the inland water-ways of the great valley, and with our second best seaport. The overlying strata present no special difficulties in the present state of engineering science.

No argument is necessary to demonstrate that the scientific and economical working of this bed will constitute an enormously profitable enterprise, nor that the profits may be continuous for generations, and this is at prices very much below the present cost of the Sicilian article.

The value and advantages of this property have been known to many competent persons for many years. But the disinclination to which I have hereinbefore alluded, and which retains capital in beaten paths, has presented its intelligent utilization. General Thomas Jordan, for instance, could give an instructive illustrative experience in connection with this very property.

The first company incorporated to deal with this property were chiefly French Creoles, of Louisiana, under the presidency of General Jules Brady. That company was rather of the opinion that a lamp-post could only be properly set by a Parisiau, and consequently imported an engineer from France. He undertook to sink a circular sectional shaft of cast iron. This broke at 110 feet, and was abandoned along with the enterprise and $250,000. The property is now owned by a company, headed by the Hon. Duncan F. Kramer, late of the Tariff Commission. I think that this company has done nothing definite.

In fact, mining enterprises in the South (outside of the gold fields of North Carolina and Georgia, and the phosphate fields of South Carolina), can hardly be expected to be carried to the productive point in Southern hands. Capital finds before it full employment in fields with which it is thoroughly familiar. Timidity, the result of ignorance, keeps it from the improvement of natural resources, in which it would find more abundant profits and infinitely less risk. Very few Southern men are qualified by technical knowledge or experience to open or manage such a property, and what few there are are necessarily in employment elsewhere than in the South.

An investment of northern capital, much less than the amount sunk in each of several "brilliant" mining ventures of the past few years, and competent management, would develop in the locality described, a most profitable, safe and permanent business.

All the same, I will venture to say that a dozen years hence we shall be importing Sicilian sulphur, and the deposits in Lake Charles and in "Tom Green" will be waiting the advent of a more enterprising generation.

PROSPECTING.—A good deal of prospecting, says the *Enterprise*, is being done to the west of Mount Davidson, among the hills down toward Washoe Lake. The country down that way is full of quartz veins, few of which have been explored to any great depth. There is also everywhere much float quartz, some of which is doubtless from veins that have not yet been discovered, they being what are called "blind leads," being covered with surface soil and debris.

THE decline in the price of copper makes it not improbable that this material will be used as roofing, among other uses. It does not have to be painted, like the tin roof, every two or three years, and it is not subject to rust.

California at the World's Fair.

We are glad to see that the people of the State are turning their thoughts quite generally to the advantage of a creditable exhibit at ths coming World's Fair in New Orleans. There is every reason, industrial and sentimental, why our State should be well represented on this occasion, which will draw people from all the country and all the world to the sunny South. There never was a great fair which can be so easily reached from this State, and probably none where a good show of our products can do so much toward spreading the fame of the State. There are several movements now in progress toward a fair display of our products. Private and corporate enterprise is enlisted in showing special products. The State Board of Agriculture is fostering the idea of making a collective exhibit from the material to be shown in Sacramento the second week in September, and probably some of the elaborate county exhibits which are now in preparation for the State Fair will be sent forward by themselves to the credit of the counties represented. The State Horticultural Society also has the matter under consideration. Beyond this, it is announced that T. H. Goodman, General Passenger and Ticket Agent of the Central Pacific Railroad Company, has requested all agents of the Central Pacific and leased lines, including the Southern Pacific railroad, to exert themselves in calling the attention to the golden opportunity of advertising the State by collecting and forwarding samples of the various products of California to the World's Industrial and Cotton Centennial Exposition, which will be opened in New Orleans next December and continue till the following May. The railroad company's agents are requested to ask the people with whom they are brought into intercourse to furnish samples of their grain, of their fruit, of their products, and also of the soil on which these things are raised. They are instructed to obtain full information about yield, mode of cultivation, extent of orchards, vineyards or grain fields, and to make careful notes of the same. Mr. Goodman, speaking for ths company he represents, says:

"We wish each county, however distant from the lines of our roads, to be fully represented. Neither do we wish to concentrate attention upon any one industry, but, by showing samples of all productions, to demonstrate to the world the great capacities and almost boundless resources of California. Experiments are being tried, many of which have demonstrated that a number of profitable industries can be added to those which have already made this State famous. It is desired to fully represent all these efforts towards productive possibilities. We wish full information regarding any and all samples, in order that the labels shall truthfully state those facts which will be interesting to the beholder of the exhibits. For this purpose we ask that each sample be carefully packed and accompanied by a label showing the name and variety of the article, the yield, the age of the tree on which grown, if a fruit, and the length of time the ground has been cultivated, and whether winter-sown or summer-fallow, if the sample is a grain; the name and postoffice address of the producer, the exact locality where grown (specifying the county and number of miles and direction from nearest town of prominence), also any other information which may be of interest. In cases where the contributor is not the producer, we wish the name and address also of the contributor."

Surely something good should come out of all these different agencies which are at work, and it is quite probable that Col. Andrews, the California commissioner, will have material to awaken the California glow afresh in his own heart and which he is reputed to impart to all who come under his influence.

Note on Patching Platinum Crucibles.

The following was read before the American Institute of Mining Engineers by H. J. Seaman, Catasauqua, Pa.:

The cost of keeping platinum ware in repair becomes such an important item in laboratories where much fusion work is done that a method of saving in this direction may not prove unacceptable to at least some of the members of the Institute.

Some two years since I had the misfortune to puncture an almost new Bishop crucible. As an experiment I endeavored to patch it, and with such success that it is still in constant use.

This may be accomplished in the following manner: The crucible and patch, which should be of stout foil, are rubbed bright with silica, or rotten-stone; a light platinum wire, welded to a corner of the patch, and the whole treated for several hours with hot concentrated hydrochloric acid; after which they are thoroughly washed with distilled water and dried.

The head of an ordinary iron rivet, 4 inches by ⅝ inches, is rounded off by hammering to somewhat the shape of the crucible. This is sunk 2 inches in a block of hard wood, and firmly wedged in place. This serves for an anvil. The hammer is an ordinary cast-iron toy, 1½ inches long and ⅝ inches in face, mounted on a ¼-inch iron rod, 10 inches long.

A gas blow-pipe is fixed in a horizontal position, and the strongest heat obtainable with it directed upon the rivet head; this soon attains a bright red heat, and the crucible is now dropped over it. The patch, by means of the thin platinum wire, is now held over the point of operation; a few taps of the hammer serve to

fix it to the crucible. The wire is now nipped off, and the patch firmly united to the crucible by continued tapping with the hammer, steadying the crucible with a platinum spatula or wire. The metal should be maintained at as nearly a white heat as possible throughout the operation. With care the metal may be so perfectly united as scarcely to show the outline of the patch. After the operation the crucible will be found very much out of shape, but it may easily be brought back by tapping with a hammer over the rounded horn of a small anvil.

I am at present using three patched crucibles; one, previously mentioned, has been in use about two years; has served for at least two hundred fusions since patching, and is still in good order. Another, which developed an extensive crack in the bottom, was repaired by a circular patch a trifle smaller than the bottom. The third has a patch on the side near the bottom. These have all done good work.

I am in the habit also of welding my platinum triangles, thereby making them light, strong and durable.

The Transport of Goods by Electricity.

Professor Fleeming Jenkin, of Edinburgh, delivered a lecture on "Telpherage, or the Automatic Transport of Goods by Electrical Means," before the Glasgow Science Lectures Association. The chairman (Sir William Thomson), in introducing the lecturer, said that Professor Jenkin proposed to apply electricity in an altogether novel way, and one which was most interesting to the society. The professor had long been interested in engineering subjects, and his latest idea was to show how goods, parcels, and possibly passengers, were to be carried overhead through the same power as that which had done so much under the sea in the shape of the submarine cable. Professor Jenkin, at the commencement of his lecture, explained the origin of the word "telpherage," and said that it was derived from two Greek roots, and meant the "far carrying." It was the old story of a person hanging a pair of boots on a telegraph wire and expecting that they would be sent to a distant friend that had set him thinking about the possibility of really carrying the idea into practical use. By means of a model railway, built upon the platform on raised supports, wires stretched from point to point taking the place of fixed rails, he proceed to explain the system upon which he would carry out his invention on a larger scale. Two model trains were set in motion and successfully made a round of the circular railway, the motors working admirably. The professor then explained the system under which the motors worked, and how the electricity was utilized in carrying along the road the load put on the suspended wire railway. In working out this idea he had simply made use of the perfectly well ascertained electric laws which had been developed chiefly in connection with electric lighting. Some ten years ago, had this idea occurred to him he should have put it to one side, as at that time there was too much to be done in respect to electricity to make it practicable. But one thing led to another, and electric lighting had developed dynamos to such an extent that sufficient power had been attained to use it as a motor, and it was the great development of that power which had led him to make the experiments the result of which he was about to explain. He then gave a description of the "line," and referred to the difficulties he had experienced in getting up a proper kind of "locomotive." He had aimed at conquering gradients that no steam locomotive could look at. It was necessary to avoid in electric locomotives all loss of power by friction. It took curves easily, and without any friction whatever, and there was hardly any possibility of the trucks being thrown off the line. A model train was next run along a model railway terminating in a series of octagon circles, and the trucks took the curves freely and without a hitch. He now came to the economical question, to see how far from being a mere toy the idea could be developed into a practical working machine able to do the work required by the manufacturers of the country. The lines were not intended to compete with the railways, but rather to act as feeders to them by collecting goods throughout districts, carrying them to the stations, where they would be put into the trucks. This would have a great influence upon the railway traffic. The class of line he would put up with posts and rods ought not to cost more than £500 per mile. For engine-power for a 25 mile line he would put down £1,500 per annum. In concluding, Professor Jenkin said he did not propose to touch upon all the matters connected with the possible development of his scheme. He would simply leave his hearers with the impression that the whole contrivance was what he might simply call an electric horse and cart.

THE copper product in the United States has increased from 11,470 tons out of a total of 78,037 tons—14.70 per cent in 1871, to 52,080 tons out of 193,454 tons—27.71 per cent in 1883.

THE number of workmen engaged in the copper mines of Prussia increased in 1882 to 12,787, as compared with 11,946 in 1881.

USEFUL INFORMATION.

WHAT PLUCK WILL DO.—The London *Times*, of a recent date, contains some interesting facts about Henry Bessemer. It was a chance remark at a gun trial, in France, which gave to the great steel king the idea of improving and strengthening gun metal. He incurred an immense outlay, he built furnace after furnace, he tried machine after machine, he took out patent after patent, and he saw the money he had amassed by previous inventions fast melting away. After sundry partial successes, he fell into disrepute, and was sneered at by the iron manufacturers as an unpractical enthusiast, while the Woolwich authorities had been snubbing him, as a matter of course. A few months later Bessemer had produced steel worth from $250 to $300 per ton, from iron that cost him only $35 per ton. "He could then see in his mind's eye, at a glance, the great iron industry of the world crumbling away under the irresistible force of the facts so recently elicited." Fourteen years afterwards these experimental works were sold for exactly twenty-four times the whole subscribed capital of the firm, after returning fifty-seven fold, and the manufacture he originated is now estimated to be worth no less than $100,000,000 yearly!

PORPOISE OIL AND LEATHER.—A new industry is growing up on the Atlantic coast, which may soon, in a great measure, supplant the loss to that portion of the Union of the whaling business. Small vessels are now being fitted out to catch porpoises, which are very numerous on the Atlantic coast and bays, and which have hitherto attracted very little attention in an industrial point of view. One of these vessels recently arrived in Philadelphia with 75 fat porpoises, from which the following products was expected: 1,000 gallons of oil, 3,750 pounds of hide for leather, and 15 tons of phosphate. The oil is said to be equal in value to sperm; leather from this source is pronounced equal to the best French calf. It has been made in small quantities for some years in England and Germany. The fish are caught in a large sea net, with wings a mile long, by which they are inveigled into a sack some 60 feet wide by 24 deep and 120 feet long. The 75 fish above alluded to were caught in two hauls, both being made in one day. If the above items are correctly stated, it will be readily seen that the business might be made a very lucrative one.

GLYCERINE WITH GLUE.—A German chemist, named Pusche, a native of Nuremburg, reported to the trades-union of that place that he met with great success in using glycerine together with glue. While generally, after the drying of the glue, the thing to which it is applied is liable to break, tear or spring off, if a quantity of glycerine equal to a quarter of the glue be mixed together, that defect will entirely disappear. Pusche also made use of this glue for lining leather, for making globe frames, and for smoothing parchment and chalk paper. He also used it for polishing; mixed wax with the glycerine is not used. The glycerine has also some properties in common with India rubber, for it will rub out pencilings from paper, so as to leave no mark whatever. A paste made of starch, glycerine and gypsum will maintain its plasticity and adhesiveness longer than any other cement, and therefore recommends itself for chemical instruments, and apparatus used by pharmacists.

TO MAKE SHEEPSKIN MATS.—Make a strong lather with hot water, and let it stand till cold; wash the fresh skin in it, carefully squeezing out all the dirt from the wool; wash it in cold water till all the soap is taken out. Dissolve a pound each of salt and alum in two gallons of hot water, and put the skin into a tub sufficient to cover it; let it soak for twelve hours, and then hang it over a pole to drain. When well drained, stretch it carefully on a board to dry, and stretch several times while drying. Before it is quite dry, sprinkle on the flesh side one ounce each of finely-pulverized alum and saltpetre, rubbing it in well. Try if the wool be firm on the skin; if not, let it remain a day or two, then rub again with alum. Fold the flesh sides together and hang in the shade for two or three days, turning them over each day till quite dry. Scrape the flesh side with a blunt knife and rub it with pumice or rottenstone.

ANALYSIS OF THE AMERICAN GLUCOSE.—The commercial samples of liquid starch sugar, or "glucose," examined by a committee appointed in the United States to investigate the subject, were found to contain from 34.3 per cent. to 48.8 per cent. of dextrose, 0 to 19.3 per cent. of maltose, 29.8 to 45.3 percent. of dextrin, and 11.2 to 22.6 per cent. of water. The samples in solid form—"grape sugar"—arranged in composition from 72 to 73.8 per cent. of dextrose, 0 to 36 per cent. of maltose, 4.2 to 9.1 per cent. of dextrin, and 14 to 17.6 per cent of water. Three especially prepared samples of "grape sugar" contained respectively 87.1, 93.2 and 99.4 per cent. of dextrose, the last being "crystalline anhydrous dextrose." The ash in "glucose" varied between 0.335 to 1 per cent., and in the "grape sugars" between 0.335 to 0.75 per cent.

MAKING ALCOHOL INNOCUOUS.—The discovery of a method for taking the fusel oil out of alcohol is creating something of a sensation in scientific circles. It is claimed that the experiment has succeeded in reducing the deaths from alcoholism in Stockholm from 600 to 100 per annum; and the inference therefore widely drawn that the new process robs the whisky bottle of its terrors. But information is lacking as to whether the product of this process still retains the ability of getting the drinker intoxicated. If liquor is still to possess the power of bringing its imbibers down to the level of beasts, by getting first uproarious and then stupid, it does not seem to make any vital difference whether it contains the fusel oil or not. On the other hand, if the power of intoxication is removed from the whisky, none of the drinkers will want it. Could anything more disgust the old toper who starts out to get comfortably full and strikes a beverage that has no drunk in it?

GLASS COATING ON METALS.—The following method has been suggested for coating metallic surfaces with glass, which may be found to answer various purposes. Take about 125 parts (by weight) of ordinary flint-glass fragments, 20 parts of carbonate of soda, and 12 parts of boracic acid, and melt. Pour the fused mass out on some cold surface, as of stone or metal, and pulverize when cooled off. Make a mixture of this powder with silicate of soda of 50 B. With this coat the metal to be glazed, and heated in a muffle or other furnace until it is fused. This coating is said to adhere very firmly to steel or iron.

ZINC ENAMEL.—Calcine 100 parts lead and 20 to 30 parts of tin thoroughly. Melt 100 parts of this mixture with 100 of white sand, and 25 or 30 parts salt. When cool, pulverize very finely. This gives a dead white enamel for the ground. The black can be formed by the addition of black oxide of manganese, or protoxide of iron. Apply to metal in form of a paste, in water to which a little glue has been added, and fire.

FLOUR FROM SPROUTED WHEAT.—The best way to ascertain whether flour has been made from sprouted wheat is to stir a sample up with water, filter, test with corallin solution, rendered red with a trace of alkali. If the flour is acid it turns yellow. Methyl orange can be used. Litmus is less delicate in obtaining the reaction.

ARTIFICIAL TEETH.—There are twelve manufactories of artificial teeth in the United States, which make 10,000,000 of those useful articles per annum. They are made of feldspar, kaolin and rock crystal.

GOOD HEALTH.

Maxims for the Season.

Keep yourself as cool as possible.—Although we are well aware that by many this direction will be treated with ridicule it constitutes, nevertheless, one of the chief means for preserving health during the warm season. It does not imply that you are to live in an ice-house, or to seek for any artificial refrigerant, but simply to avoid all unnecessary excitement, whether mental or physical.

Let your clothing be light and loose.—At the same time that this maxim is adhered to, care must be taken, whenever any sudden reduction of temperature occurs, to adapt the clothing to this change; hence, a warmer dress will be required early in the morning and late at night than during the middle of the day.

When in a state of profuse perspiration, never throw off a portion of your clothing.—The best plan in such cases is to retire immediately within doors, and change the damp clothes for others perfectly dry, the whole surface of the body being previously well rubbed with a towel. The same precaution is proper when you have been accidentally wet by a shower of rain.—*Journal of Health.*

THE GERM THEORY.—Interesting news comes from India which will strengthen the germ theory of contagious diseases. The German Medical Commissioners who visited Alexandria to study the origin of the plague there last fall, and later went to India for a similar purpose, report that they have found the same kind of parasite in a water tank in Calcutta, and in a suburban village where the cholera appeared, that was discovered in the intestines of victims of the last plague in Egypt. This shows that the disease in Egypt was probably cholera pure and simple, and not a disease similar to it. It also tends, as we have said, to sustain Dr. Koch's theory that cholera is caused by a thread-like parasite, which enters the body. Much remains to be done before this hypothesis can be fully accepted. The bacillus, for instance, must be cultivated and be made to cause cholera in animals. After that it will be time to inquire whether it is possible to produce a mild and harmless form of this disease in human beings, and thereby prevent the ravages of pestilence.

STRANGELY AFFECTED.—Several years ago a daughter of Hon. A. C. Ramage of this county was bitten by a copperhead snake on the thumb of her right hand. The only sign of injury at the time was two very small globes of blood from two almost imperceptible marks as of a needle point. The young lady was not aware, at the time she was bitten, of the presence of the snake; but a few minutes after noticing the two marks on her thumb her hand and arm began to swell, and she became deathly sick. It was several hours before the fact that she had been bitten by a snake was learned—not until her father went to the tree under which she had been seated, and there discovered the snake, which seemed quite as sick as the lady. He killed the snake, and, returning to the house, every possible remedy was applied to save the life of his daughter, and, though she lay for weeks when there was little hope, she recovered. The remarkable part of the occurrence is that the daughter is still living, is married, and has several children, and every year on the return of the anniversary of the date of the poisonous bite, the right hand and arm become spotted and swelled, and the sickness and symptoms attending the first occasion all return, and strong and vigorous remedies have to be applied as at first. Just now the lady is writhing in agony, and fears are entertained of her recovery as the case seems more violent this year than since the first attack. The effects of this kind of poison on the human system ought to be an interesting study to the medical fraternity. In this case none of the children are affected.

FERRATED SYRUP OF PEACHES.—A new and very pleasant mode of administering iron is recommended by an Italian medical journal, the *Gazetta Medica di Torino*. The preparation may be made as follows: Take of good ripe peaches, free from the stone, 1,000 parts (by weight); iron filings, free from copper, 50 parts, and sugar 300 parts. Put the peaches in an iron vessel and mash them up, mixing sufficient water with them to make a paste; add the iron filings and set the whole to macerate for ten days, stirring frequently; then filter through a thick cloth to obtain the extractive matter. A little water is poured on the residue and filtered through paper. The filtrates are mixed, and to the fluid, which is of a brownish-green hue, is added the sugar. The mixture is now simmered at a moderate heat (not over 60 C.) to the consistence of a syrup. A clear greenish-brown fluid is the result, having the taste and smell of peaches, and giving the usual reactions of the iron preparations. The preparation is said to be very pleasant to the taste, and nearly or quite free from the disagreeable taste of iron as usually administered.

DISINFECTING THE SICK CHAMBER.—Dr. Vilandt recommends that the atmosphere of a sick chamber where the patient is ill of diphtheria, measles, scarlet fever, or any allied disease, should be impregnated with the odor of a mixture of equal parts of turpentine and carbolic acid. Half a teaspoonful of the mixture will be enough at a time, if it is put into a kettle of water kept near the boiling point. The odor generally gives some relief to the sufferer, and tends to prevent the spread of the malady. A disinfecting lamp can also be advantageously used and may be easily prepared for purifying any place where a disagreeable odor is perceived, being especially useful in sick rooms and in damp cellars where vegetables have decayed. Take any glass lamp for burning kerosene or oil, fill it with chloric ether and light. The old fashioned camphene or burning fluid lamps, with a small, round wick, will burn longer and be of more service than the flat-wicked lamps. While the ether burns, a disinfectant escapes that will soon purify the most offensive atmosphere, even that of a sewer.

POISON IN TIN CANS.—That serious if not fatal results have resulted from eating fruits, meats, etc., that have been put up in tin cans, is a fact generally acknowledged; but the source of the poison seems to be a matter of much doubt. At a late meeting of the Academy of Sciences, in this city, Mr. F. Gutzgow said, referring to the belief expressed by members at the previous meeting as to cases of tin poisoning, which had been reported, of persons who had eaten of canned provisions, that he had investigated the matter and found that the poison did not come from the lead in the alloy of the spurious or base tin of which the cans are made. The amount of lead that is taken in solution by the acids is too infinitesimal to be injurious, and besides it is precipitated in the solution. The poison must be from other causes or sources.

SNAKE POISONING.—Sir Joseph Fayrer, who has been investigating snake poisoning, says that to him one of the greatest of mysteries is that a poisonous snake cannot poison one of its species, scarcely its own congeners, and only slightly any venomous snake; but it kills innocent snakes quickly. A vigorous cobra can kill several dogs, or from a dozen to twenty fowls before its bite becomes impotent, and then the immunity is of slight duration, for the virus is rapidly re-secreted.

LIGHT AND HEALTH.—Investigations concerning the effect of different forms of artificial illumination on the health have shown that the tallow candle is the most unwholesome agent, and the eclectric light the best. The incandescent electric lamp produces only about 1-30 as much heat as the tallow candle, while it gives out no carbonic acid or water. One gas jet in a room is said to vitiate the air as much as six persons.

POISON IN ICE CREAM.—It should be more generally known that aniline colors are used in giving tints to ice cream; more particularly to raspberry cream. These aniline colors are used also, the world over, for coloring wines and some other kinds of liquor, and they are dangerous poisons.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Calaveras.

WEST POINT.—Cor. Calaveras *Chronicle*, July 26: Rich rock has been struck in the south level of the Scorpion mine, which shows plenty of free gold. The rock is about fifty ft distant from the ore chute which the level is being run to tap. The Blazing Star mine is turning out splendidly. Width of vein, 2½ ft. The owners are satisfied that they have a first-class property, and are going to work it with the necessary machinery. Levels are being run on the old Henry mine, which show a splendid vein of quartz from 14 inches to 3½ ft in width. The south level is in a distance of 150 ft and the north level 30 ft; good rock all along; ore on the dumps, 60 tons; 30 tons in mill which is kept running day and night. The Bismarck mine is turning out plenty of rich rock, and the arastra mill of Schmidt & Co. is kept busy grinding it. Width of vein, 2½ ft; owners, Mentzel & Co. The Lockwood mine is being prospected by Messrs. Russell, Schrives & Co. Mr. Haskins is opening up the Mitchell mine by tunnel and shaft. We understand that the Billy Williams mine, at Skull Flat, is going to start up shortly under the sway of Messrs. Rowe & Jenkins. The mine paid well in former years. The Lone Star mine has been turning out some more of its bullion. There are about thirty tons of ore in the mill, which will average $130 per ton, and plenty more of the same kind in the mine. Bullion product since our last report: Novella mine, 5 tons, $140; Widows mine, 5 tons, $500; placer mines, $632.

El Dorado.

AT WORK.—Mt. *Democrat*, July 25: The Melton brothers and Day have commenced active operations at the Day mine, near Grizzly Flat, and we may soon expect to hear of a new "Grizzly boom." Some fine nuggets of gold bave recently been found at the Stephens mine, near Texas Hill, some of tbem weighing over two ounces.

CRYSTAL MINE.—At the Crystal mine, in Mud Springs township, they have all the machinery on the ground for adding five more stamps to the mill; also two new concentrators, two Pelton wheels (one for the stamps and the other for the concentrators) and a quantity of sixteen-inch pipe. This looks like business.

GOOD NEWS.—On Wednesday last, while the men were grading to get a foundation for the new blacksmith shop near tunnel No. 2 of the Melton mine, Grizzly Flat, a new chute of ore was unearthed, which prospects splendidly. Several tons of the ore has been taken out, which looks better than tbat taken from near the surface at any other point. Everything of late seems to indicate that Superintendent McClellan has a better mine than even he himself had hoped for.

Inyo.

WILD ROSE DISTRICT.—Inyo *Independent*, July 26: A revival of industry is manifest at the mines of the Wild Rose district. Messrs. W. K. Miller, J. M. Keeler and N. J. Medbury have been taking ore from the Mohawk, Blue Bell and Argonaut mines, formerly known as the North Star, Garibaldi and Nellie Grant. A shipment of ten and one-half tons of ore was lately made from the mines to the Snow's Canyon mill, and worked. From this the proceeds were four bars of bullion, weighing 3,400 ounces. Most of this is silver, but as no facilities for assaying are at hand, the exact value cannot be given till returns sball be had from San Francisco. The credit of this work is chiefly due to Mr. Miller; he had the ore taken across Panamint Valley, thirty miles, to the mill, in order to prove its value. From the result of this experiment, it is easily seen what wonderfully rich results would be produced by a mill close to the mines, where there is an abundance of wood and water. M. G. Nixon has bought the Freeborn Canyon mill and mines, and expects to have a force of men at work by August 3d. We can now look for this mill to produce regular monthly shipments of bullion as in former times. The mines at Chrysopolis are now to be worked vigorously. Superintendent Bolinger has put a force of men to work and will develop the mines as rapidly as possible. S. A. Densmore has leased the San Carlos mines to J. M. Keeler, wbo will put a force of men to work on them next Monday.

BEVERIDGE BRIDGE.—The bridge across Owens river at Beveridge that was impassable lately is now in thorough repair. Through the energy of Road Supervisor Palmer all damage has been repaired.

Mono.

RICH STRIKE.—Bodie *Free-Press*, July 23: Considerable excitement was created yesterday when it was ascertained that an exceedingly rich strike had been made at Sweetwater in the California Comstock, a mine that has been prospected quietly for several months past. Parties interested were anxious to perfect their title to some of the adjoining claims and had kept the strike secret from the public. The porphyry belt of Patterson district is about seven miles long by four miles wide; lies between the East and West Walker rivers and is on a separate or distinct range of hills—entirely independent of the Sierras. The country rock is composed of dark gray syenite. At the extreme north end of the belt copper appears mixed with a small percentage of silver. The California Comstock is situated about two and one-half miles west of the Kentucky and on the apex of a hill, where the shaft was sunk; the mineral belt is mapped out to the northward by the North Comstock, First North Extension, Great Western, Lookout and Star locations. In the other appears the Huntoon and Geneva. The shaft of the mine in question is at an elevation of 11,090 feet and was sunk only about 35 feet. It showed an ore body 25 feet wide where it was stripped which averaged an assay of $50 per ton of silver with four per cent of gold, free milling. A streak of six feet in width in the same went into the hundreds. About three feet of debris was removed in stripping the ledge. The tunnel is situated about 300 feet below the shaft where only 8 feet was run before the same ledge was encountered. This is what constitutes the strike as they have cut 10 feet into solid free milling ore which will average, according to fair estimate, $70 per ton. The hill is very steep, over 45 degrees, and the ledge dips in such a manner that it comes nearly to the surface where the adit is run. They have 150 tons of $75 ore on the dump and with that of inferior grade it measures about 2,000 tons. Experts claim it is the biggest milling proposition outside of Virginia City. The owners of this bonanza are as follows: A. Snyder, Geo. Courtnage, Ed. Reading, Harry Wilcox, A. Soderling, W. Trudgeon, A. Anderson and Alex. Stewart.

Nevada.

SNEATH AND CLAY.—Nevada *Transcript*, July 26: The Oneida, Chief S. M. Co. has received a United States patent to the Sneath & Clay quartz mine, which is situated on Gold Flat, near the railroad trestle. We are not advised as to wbo compose the above company, but believe the property in question belongs to Eastern parties. Years ago the Sneath & Clay was remarkably rich and it is tbe opinion of many mining men that there is plenty of good rock there yet.

Plumas.

COARSE GOLD.—Plumas *National*, July 26: From the new strike on Hopkins creek, the gold is coarse, and tbe rock is filled with it in such a way that there is no room for doubt that a very important discovery has been made. The first location made is named the American and extends 500 ft one way from the creek, and 1,000 ft the other. The ledge shows about 4½ ft in width, and the rich prospects spoken of are found directly in the bed of the stream. This is owned by Hersem, Haines and others, of Onion Valley. Four other locations have been made, and we believe they all sbow the ledge in good shape. Those who have been on the ground consider the prospects for a prosperous quartz camp very flattering, and much work in development will soon be done.

Siskiyou

FORKS OF SALMON.—Yreka *Journal*, July 25: The mining season is approaching a close for tbis season. McNeal & Co. have just shut down piping and are engaged in cleaning bedrock. Hugh Grant is still running his pipe, and has had, I believe a very successful season.

PICK AND PAN.—Yreka *Journal*: Kittlewood and Company below the mouth of Scott River have just finished tbe construction of their head dam. Mapleson and Company, also below the mouth of Scott river, are working away under the most favorable circumstances. Tim Austin and Company and Barton &Co., on the Klamath are very well satisfied with the outlook and are putting in full time. Kohl and Mott on the Klamath are putting in new wheels and will begin operations as soon as completed. Jackson and Crary above Oak Bar are working a full force and expect a good yield. Doggett and De Mora are making big money in their claim near Oak Bar this season. The Big Joe Company on the Klamath are experiencing some trouble with their pumps which has somewhat delayed work, but expect to have everything in good shape in a few days. All the China companies on the Klamath are doing well as usual. The Fort Jones Company are having a profitable run, gold being discernable in the gravel. Two hundred and thirteen ounces were taken out in eight days, not long since. The Empire Bar Co., are working within ten feet of bedrock, which they expect to reach shortly when they will find big pay. The Centennial Co., are working the surface at present and are making expenses. As soon as they get down to bedrock they will encounter rich gravel. The Kanaka and Freshour Bar Co's have just commenced work. Both of these claims have paid handsomely in the past. The Lime Gulch Co., are running a prospect drift and are encouraged by the appearance of the dirt. Wm. McConnel in his claim is putting up a second derrick. He has been baving same trouble with his electric lights, the battery not being strong enough to run both, but one works in a perfectly satisfactory manner. The claim still continues to pay largely. Magoffey Brothers on Scott river are doing well. Garretson & Co., at Quartz Hill have had a profitable run. In the San Jose claim a cut is being made to the main channel. Martin Andrews has moved considerable dirt this season, and will make a big clean-up. He has a 400 ft. pressure of water. Mr. Hetchel has discovered a good quartz prospect above Scott Bar. He found native quicksilver in the clay gange. W. W. Eastlick and brother at Oro Fino have closed for tbe season with satisfactory results. In fact, the claim paid well, considering that they were not down to bed-rock. R. H. Campbell & Co., in Quartz Valley are cleaning bed-rock; will finish up in two weeks. We learn that they have already secured nearly $50,000 and the sum will no doubt be swelled to $75,000 at the wind-up. Expert miners, who have opportunities for knowing, claim that the clean-up will not fall short of that amount. Wright and Fletcher have cleaned up in their claim at Oro Fino and are well pleased with tbe returns. They enjoyed only a short run but an exceptionally good one, taking out more dust than they ever have before in the same length of time. They prospected some dirt which paid all the way from an ounce to $25 per pan. Mr. Wright is now in Weaverville looking into the merits of a new elevator and if it works to his satisfaction one will be placed in the claim in which he is interested at Oro Fino. Their claim is one of the richest in the county and both being practical miners, it is operated to the very best advantage. They have sufficient ground to last for the next 50 years notwithstanding that it is worked upon a large scale.

San Bernardino.

CALICO DISTRICT.—*Print*, July 26: The various mines in Calico district are constantly improving by developing, and none which we have seen show any signs of petering out. East Calico district especially is developing some very fine properties, and somewhere in Oriental canyon we expect a town to spring up that will vie with Calico. Near the Bismarck mine about 250 men are working. The Garfield mine keeps holding its own, although nothing can be learned from the managers—everything in and around the mine indicates prosperity. The new tunnel started a few weeks ago is now in some three hundred feet, and a tunnel to meet it has been started on the west side of the Occidental hill, and is pushed forwarded rapidly. It is predicted by expert mining men that a large body of ore will be struck in tbis tunnel much richer than any which has yet been discovered. The Garfield property is the richest in Calico district, and we have yet to learn of its best days. The chloriders on the Occidental ground are rapidly changing that property to one vast mine. The largest part of the men who have chlorided there have made money and are now taking out some very rich ore. The royalty already paid Mr. Raymond by the lessees of the claim amounts to $6,000, within $2,000 of the first cost of the entire property. This shows how the Oriental Co. have spent money in Calico district. The Bismarck mine retains its force of 20 men, and are hauling their ten tons of ore each day to the company's mill at Hawleys. The Bismarck mine has a mammoth body of ore in sight, and we learn from tbe Superintendent that it will take two years at least to work it out witb a large force of men. The force will be increased about October 1st, to about 60 men, if better facilities are secured for the quicker reduction of large quantities of ore. The Blackfoot mine and Sam Houston No. 3 are being worked by R. B. Johnson. He has six men employed. The ore is in large quantities, but the assay value is not high, although it will net well after being worked. A shipment will be made in a few days to the Sampling Works, and a large force of men put on in the course of a week or ten days, as there is plenty of ore in sight and easily worked. The Snow Bird mine is working six men, and is shipping some very fine ore to their mill. Mr. Sinclair claims he works his ore closer than any other mill, and makes very low grade rock pay. The mill employs eight men, and is working night and day, running through between six and seven tons of ore each day. The Lyon claim is being prospected by Dr. Ghiselin. Some very good ore has been taken out, and has every indication of being a valuable piece of mining property. A fine body of ore has been struck in the Maiden claim owned by Messrs. Stacy and Raymond, and it promises to develop into a fine ledge of mineral. The Cuba mine owned by Lieut. Gov. Gaggett is being rapidly developed. About 25 men are employed, and ten tons of ore is the daily shipment. A great deal of the ore is bigh grade, and does not require very close sorting.

Sierra.

EXPRESS.—Sierra *Tribune*, July 26: The Express M. and M. Co.'s quartz property embraces three locations—the Meadow, Star and the Golden Cross, situated on Butcher Ranch ridge, about three-fourths of a mile from Hog canyon. On the Golden Cross claim a shaft has been sunk to a depth of 75 ft, encountering an eight-foot vein. From the bottom of the shaft a tunnel has been started into the hill, which will eventually tap the ledge at a distance of 300 ft below the surface. Another shaft has been sunk 40 ft on the Meadow ledge. This is a north and south vein and averages about five ft in width. In the bottom of this shaft a second ledge, measuring 4 ft and 7 inches, was uncovered, running east and west, or at right angles with the Meadow vein. Work is also progressing on two drain tunnels which will be run 120 ft. Mr. Mead expects to have these completed in about six weeks. Practical miners give very favorable reports of the various prospects being operated upon in that vicinity. The ledges mentioned above are ranked among the most prominent of these, and from all accounts the owners have no reason to feel discouraged with the prospect as far as they have gone.

STRIKE IN MOHAWK.—Sierra Valley *Leader*, July 23: Quite an important strike in the mining line is reported from Mohawk. Mr. Black and John Poe are working on the ledge, on which they have drifted a distance of 25 ft from the foot-wall and the hanging-wall has not yet been reached. The rock is said to prospect well for the whole distance. In a specimen which is on our desk, go'd in considerable quantity can be plainly seen. It is the intention to erect a mill on the ground this season.

Tuolumne.

OAKLAND MINE.—Tuolumne *Independent*, July 25: This mine is about three miles east of Columbia, and adjacent to the celebrated Arnold, Rifle, Smoothbore, and a number of other valuable mines. What is now known as the Oakland mine embraces several locations originally made along the vein or veins, within the limits of said claim, to wit: Auburn, Little Ida, New York and Oakland, and is undoubtedly in all as valuable a piece of mining property as there is in the county. The company commenced the opening out of the mine something over two years ago, which has been an up-hill business. But past experience has taught the company a good lesson, wbich it will "remember by-and-by," and now a new era in the management of its affairs, pertaining to the working of the mine, based upon the most practical methods, is the result. A new stamp mill has just been put in place on the mine, in connection with all the most improved machinery for concentrating and separating, and was started up two days ago, working to a "charm" and giving perfect satisfaction in all its parts; and, furthermore, which is still more encouraging, the plates already exhibit a big showing of amalgam. Captain W. E. Bushnell, Eli Denison, J. Massey and D. West, all connected with the C. P. R. R., are the principal shareholders, and three other prominent business men of Oakland, whose names we were unable to obtain at the time, constitute the company. An offer of $100,000 has been refused by the company for their mine. The practical testing of the mine, as to whether the vast bodies of ore that may be cheaply extracted from it will yield, on the whole, a good profit through the ordinary milling process or not, will be tbe means of determining, to a great extent, the value of undeveloped mines located in the same belt. On the whole, the outlook of this mine, at the present, is beyond the most sanguine expectations.

NEVADA.

Washoe District.

SIERRA NEVADA.—*Enterprise*, July 26: Since last report no work has been done in west crosscut No. 4, on the 3100 level. Opposite this crosscut has been started, east crosscut No. 1, which was yesterday out 12 feet. The rock is about the same as that in the drift from which the crosscut starts. These crosscuts are at the extreme north end of the main nortb drift, where no diamond drill holes have been made. The ground is quite dry. Work has been resumed in west crosscut No. 3, 300 feet north of the joint Sierra Nevada and Union Consolidated winze. The crosscut is now out 25 feet. It is in vein material of about the same character as that passed through by the main north drift. The joint Sierra Nevada, Ophir, Mexican and Union Consolidated winze, below the 3200 level, has been sunk and timbered eight feet. It is still in the bastard quartz formation, with some porphyry coming in. As yet this porphyry is in the shape of detatched masses or bunches.

HALE AND NORCROSS.—Work has been resumed on the 2800 level in the way of cleaning out the drifts and preparing to advance that running northward. Though the blowers have been set up and the air pipes connected, it is still pretty hot, except immediately about the ends of the pipes. Drifting will probably be commenced to-night or to-morrow. The blowers will furnish such a supply in the face of the drifts as will enable the miners to work in comfort. During tbe past week over 400 tons of ore were extracted and sent to the mills. The sum of $14,000 has been received as a partial return from the Eureka mill on the July account.

UNION CONSOLIDATED.—The only work being done at present is jointly with the Ophir, Sierra Nevada and Mexican, on the 3200 level of that company, in the winze which is designated to explore the north end of the Comstock to the depth of 3300 feet or more. Work in this winze is progressing steadily.

BEST AND BELCHER.—On the 2500 level the joint Gould and Curry west drift is making about 40 feet per week. It is now in softer ground than heretofore, and is showing some quartz feeders of a favorable appearance. The joint Consolidated Virginia west drift is being advanced at the rate of over 30 feet per week in vein material that sbows stringers of quartz.

OPHIR.—The new west drift on the 500 level is out about 30 feet. It is in ground that blasts very well. Some ore is still being obtained on the 250 level by taking out and assorting the filling of the old drifts. The work being done jointly with several other north end companies in sinking the deep winze on Mexican ground is progressing favorably.

MEXICAN.—The winze on the 3200 level, which is being sunk jointly with the Ophir, Sierra Nevada and Union Consolidated companies is now making fair progress. An increased amount of porphyry is met with, but it is still in detached bunches, the mass of the material being a bastard quartz tbat does not blast well. The winze will be sunk and timbered about eight feet this week. There is a small flow of water which the pumps easily handle.

GOULD AND CURRY.—The joint Best and Belcher west drift on the 2500 level is now being advanced at the rate of about 40 feet per week. Some promising quartz feeders have been cut through and the porphyry is becoming softer. The drift is now out nearly 300 feet.

CONSOLIDATED VIRGINIA.—Water having made its appearance in the main south drift on the 2900 level, the diamond drill has been put into the face, and is being sent ahead to explore the ground, which gives signs of being very wet. Drill holes have been run in several directions from the face o the drift.

ALPHA CONSOLIDATED.—The north drift is now out about 545 feet. It is going a little east of north, and has shown up a large quantity ot quartz. Until recently this quartz has been barren; now, however, it is beginning to give assays of a few dollars, indicating that further north a body of paying ore will be found.

CHOLLAR.—Good headway is being made in the main south drift on the 2600 level. It is in vein material that sbows frequent streaks of quartz and seams of clay. All the machinery at the Combination shaft is running smoothly, as also is all the pumping apparatus.

ALTA.—The diamond drill is being run east on the 2150 level. Drifting bas been resumed in the west drift on the same level, and the belt of fertile ground passed trough by the diamond drill in that direction will be thoroughly explored.

ANDES.—The winze is now down about 50 feet. It yet has between 20 and 30 feet to go to tap the vein. The material is unchanged. The north drift is still in porphyry, with streaks of quartz of a favorable appearance.

YELLOW JACKET.—The usual quantity of ore is being extracted and sent to the Carson river for reduction. Considerable prospecting is being done at various points.

UTAH.—The southeast drift on the 1050 level has been advanced 28 feet during the week. It is at present in vein porphyry that shows streaks of clay.

CROWN POINT.—The mine is yielding the usual quantity and quality of ore, keeping the mills on the Carson river in constant operation.

CALIFORNIA.—The work here is joint with Consolidated Virginia, which see.

Columbus District.

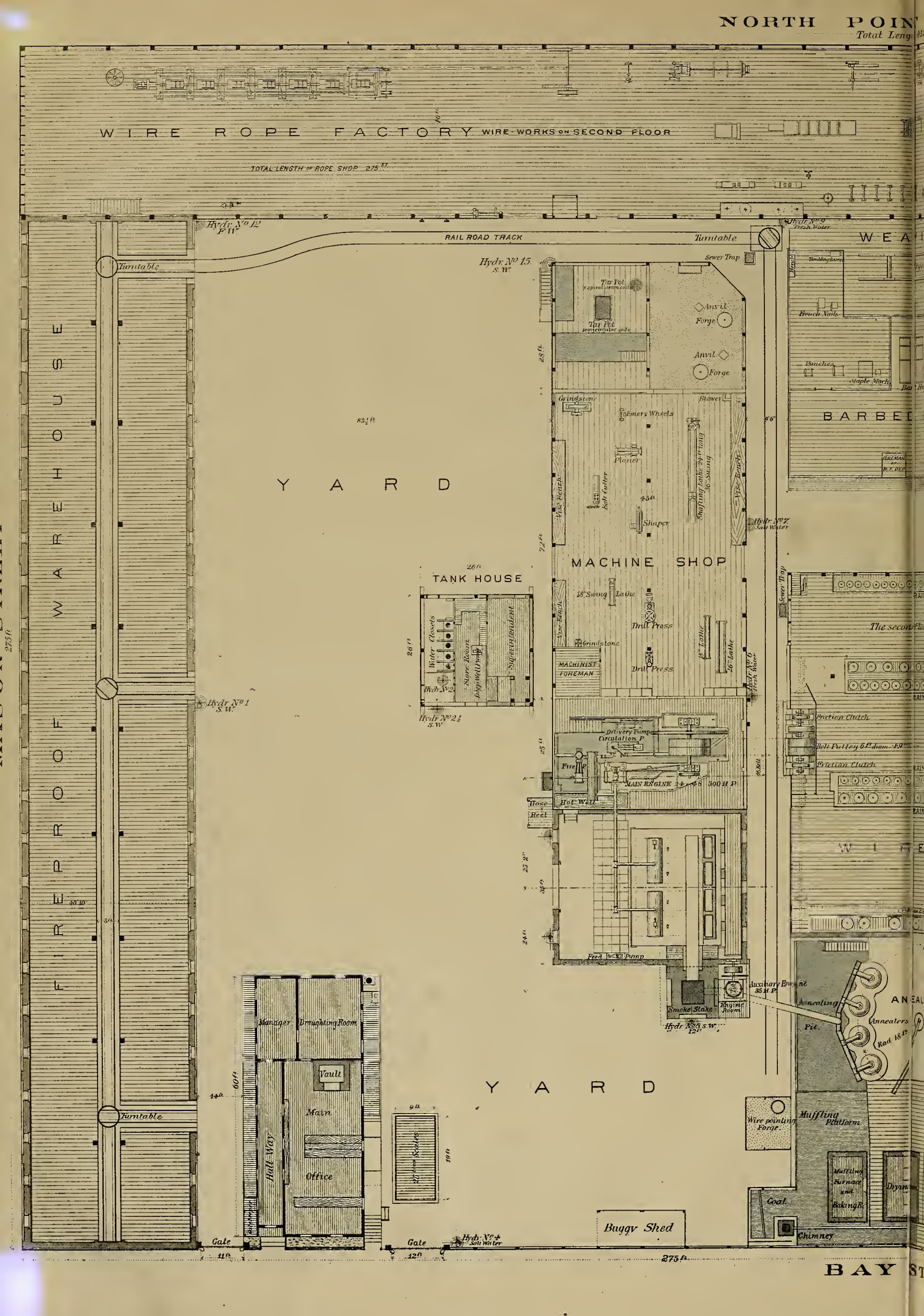
MOUNT DIABLO.—*True Fissure*, July 26: The north drift from winze No. 5 is in 27 feet, and has cut two small seams of ore of good grade. The raise from the east drift on the third level is in 20 feet, and shows ledge matter with a little low grade ore. The west intermediate, between the second and third levels, is in 120 feet, and shows some 18 inches of $60 ore. The east intermediate, between the first and second levels, shows a small ledge of $60 ore. A small amount of ore has been taken from the east drift on the third level during the week. The west drift from the fourth level has been driven 8 feet, and shows ledge matter in the face. Work has been resumed in the fifth level, and the east drift is being driven to connect with the incline.

Sherman District.

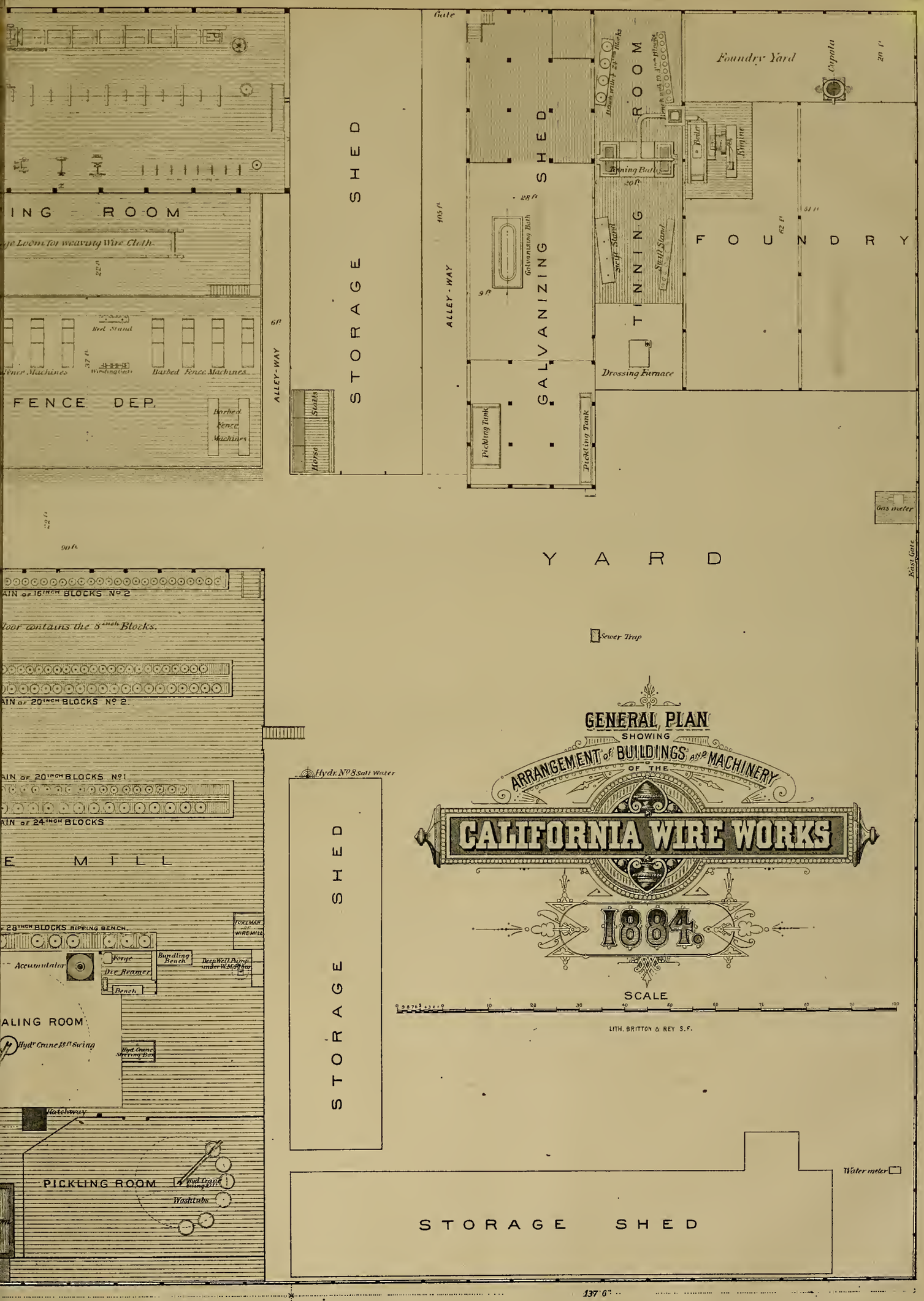
ENCOURAGING OUTLOOK.—Reno *Journal*, July 23: Jim Burke has resumed work on his mine in Sherman district. The bottom of the shaft last Saturday was in soft, decomposed quartz, containing considerable black sulphurets. The ore very much resembles some of the rich quartz taken from the Con. Virginia. Mr. Burke is very much elated with the prospects. When the shaft is down 100 feet, drifts will be run north and south on the ledge.

Lexington District.

PROSPECTING.—Cor. Piute *Record*, July 23: Utah parties from the East have lately visited Lexington Canyon for the purpose of investigating and prospecting that section, and I learn, from a reliable source, that everything was very satisfactory, and Mr. Eppley had gone East with the parties to close tbe sale. This insures the building of a mill in that camp, and active operations generally.


NORTH POIN
Total Leng
WIRE ROPE FACTORY WIRE-WORKS on SECOND FLOOR
TOTAL LENGTH of ROPE SHOP 275 FT.
RAIL ROAD TRACK
Turntable
Hydr. No 12 F.W.
Hydr. No 15 S.W.
Hydr. No 3 Fresh Water
Sewer Trap
Tar Pot (steam coils)
Tar Pot semicircular coils
Anvil
Forge
Grindstone
Blower
Emery Wheels
Planer
Vise Bench
Bolt Cutter
Shaping table 24" long 36" Swing
Shaper
Hydr. No 7 Salt Water
MACHINE SHOP
TANK HOUSE
Water Closets
Store Room
Deep well Pump
Superintendent
Hydr. No 2
Hydr. No 24 S.W.
Hydr. No 1 S.W.
18" Swing Lathe
Drill Press
Grindstone
MACHINIST FOREMAN
15" Lathe
24" Lathe
Hydr. No 6 Fresh Water
Sewer Trap
Delivery Pump
Circulation P.
Fire P.
MAIN ENGINE 24 x 48 300 H.P.
Hose Reel
Hot Well
Feed
Pump
Auxiliary Engine 35 H.P.
Smoke Stake
Engine Room
Hydr. No 5 S.W. 12"
Friction Clutch
Bolt Pulley 6 Ft. diam. 10 in. face
Friction Clutch
The second
W I R E
Manager
Draughting Room
Vault
Main
Office
Rail Way
Turntable
Gate
Gate
Hydr. No 4 Salt Water
Buggy Shed
Wire pointing Forge
Muffling Platform
Annealing Pit.
Annealers
Rad 18 ft.
Coal
Muffl'rs Furnace and Baking R.
Chimney
Drying
FIRE PROOF WAREHOUSE
275 ft.
110
120
275 ft.
BAY ST

STREET



POWELL STREET

137' 6"

STREET

Taylor District.

GENERAL NOTES.—Cor. Pioche *Record*, July 19: I should judge it to be a very dull camp, and a good place for those in search of employment to remain away from. The Monitor is undoubtedly a good mine, and is paying its lucky owners—who, by the way, are hardworking industrious miners—a handsome monthly dividend. The ore is free milling, and, as I have been informed, assay 150 ounces per ton. Some 30 men are employed in the mine, and more would be put on but that there is a surplus of ore at the company's mill. The Argus is distant some four or five hundred feet up the hill, and is also a valuable property. At the time of my visit there was only 20 men on the pay-roll, the company having laid off some 14 men a short time previously, but I was informed that they were being put on again as fast as there was room made for them. So much for a very limited knowledge of the camp. Taylor, however, is a pretty little camp, being located about 1,000 feet above the valley among the pine and cedar trees.

TAYLOR NOTES.—Cor. Eureka *Sentinel*, July 26: The Argus Company paid off its miners on the 15th and made times lively for a few days. The Argus Company settled with Wm. Warrener, the man who got hurt while at work in the Monitor blacksmith shop by a rock blasted from the Argus mine. He was given $1,000 in money, and had his doctor's bill and other expenses paid since the accident last January, some $950. There is some talk of Mr. Carothers opening up some more of his mines in Taylor District.

Osceola District.

THE CAMP.—Cor. Pioche *Record*, July 19: Finding the camp rather quiet, I departed at 10 P. M. for Osceola. Osceola is at present very dull in consequence of the water giving out. As I write there are only five men chloriding in the gulch, and by the time this reaches you there will be six. There has been considerable work done here this past spring, however, but few have made any money notwithstanding all letters from this place to the contrary. This is due to the fact that most of the ground gone over had been worked before, the large gravel deposits, of which there are some 700 acres, being owned by Messrs. Godbe, Hampton and St. Perrie. This company has been busily engaged here for the past five weeks in prospecting said deposits, and after a little over four weeks' labor in washing, cleaned up the snug little sum of 198 ounces in gold. They realized from one pit of 3,000 cubic yards, 104 ounces, or an average of 55 cents to the cubic yard. In this pit was found a nugget weighing 16½ ounces. Another pit on the upper end of the same gulch panned out at the rate of $1.15 per cubic yard. The company, although doing very well, were under heavy expense, because in prospecting from one place to another they had to cut ditches, build dams, etc., whereas if they handled, all their water on one piece of ground, with a large nozzle, they could have accomplished ten times the labor. In conversation with one of the firm recently he said that the test was highly satisfactory, proving conclusively that there was millions upon millions in the large gravel deposits, if there was only water to take it out. When asked if there was any truth in the rumor that the company intended laying pipes with a view towards bringing water to camp right away, he answered: "No, but that they intended doing so as soon as sufficient funds were raised for that purpose."

Esmeralda District.

AURORA'S PROSPECTS.—Walker Lake *Bulletin*, July 26: Favorable reports still come from Aurora. The mines now being worked belong to a class which has, until the last two years, attracted but little attention. They yield low-grade ore, which, in former years, was not considered worth working, but now, with better appliances and greater experience, they are being worked profitably and are developing into exceedingly valuable properties. These mines are wide, plainly developed lodes, in which the mineral is more generally diffused than it was in the veins heretofore worked in this district, and, so far as developed, they gradually yield greater returns as depth is attained. But this development, though extending over a period of something more than two years, is even yet extremely limited, owing to the need of capital by the owners of this particular class of veins. On none of these mines has there been any working at a greater depth than 100 ft, if so deep as that. The ledges have been carefully crosscut and levels run at various depths, which, although not opening the mines sufficiently to admit the working of a large force, proves that at no distant time mining will be carried on to a greater extent than ever, the class of property being such as to warrant extensive plans and assure a long continuance of profitable work. That such is the case is shown by the frequent visits of capitalists and the deep interest they take in the situation. Those well able to form a correct judgment as to the future are making estimates as to the cost of railway connection of the mines with large water facilities, where cheap reduction of the ores can be obtained. Such a project would not be entertained except with the knowledge of many years of production, as the original cost would be too great to be justified by the short life of the ordinary mining camp.

Tuscarora District.

ARGENTA.—Times *Review*, July 24: South crosscut on the 400-foot level is in 175 feet; ground still very hard.

NORTH BELLE ISLE.—Work on the 70-foot level has been suspended during the past week, to permit of some improvements being made in the ventilation.

INDEPENDENCE.—There is no material improvement. The usual progress has been made with the work on the 300-foot level.

NAVAJO.—The joint Navajo and Belle Isle line crosscut, 150 level, has been advanced 8 feet; total length, 23 feet. Good progress is being made with the work at all points, and the usual amount of ore is being extracted and sent to the mill—some of it from the chambers in the foot wall of the west vein, and a part from the 250-foot level stopes on the east vein. Average battery assay for the past seven days, $185.76; workings, 92%.

Safford District.

ASSURED FORTUNE.—Eureka *Sentinel*, July 25: Col. Joseph Tyson, of Safford, who is in Eureka, tells that he regards the future of that camp as better assured now than ever. The contractors working in the Onondago have just completed a tunnel, 522 feet in length, tapping the mine 230 feet below the surface. This is the chief mine there at present. Who will own it is now the question, owing to the claims of Ben Safford's heirs, who are legion. Until the ownership is settled, everything else will be held back.

Paradise District.

THE MINES.—*Silver State*, July 22: L. H. Morse and H. B. Luther, who arrived from Paradise yesterday, say the mines are looking well. A force of men is employed on the Bullion mine taking out ore, and that mine, as well as the Wild Goose and Paradise Valley, is producing rich ore.

ARIZONA.

THE QUIJOTOA STRIKE.—*Epitaph*, July 23: W. H. Smith Supt. of the Peerless mine writes as follows to the Secetary of the company: All work in and about the various mines is being pushed ahead with due energy, and better progress has been made since putting in the fans. Peerless tunnel No. 1 is in 227 feet. The former contractors have finished their contract and a new contract has been let out, better progress will be made in the future. Crocker tunnel No. 4 is in 227 feet. This tunnel has been advanced nearly 40 feet since cutting the vein. The face is now in fine looking quartz, showing assays from $20 $150. Quite a cave or opening has been encountered during the week, showing fine ore and regular stratification. From the general appearance it shows a vein of great strength and magnitude. Crocker No. 5 is 79 feet. Face of drift to-night is coming into quartz. The winze is down 134 feet. South drift from tunnel No. 2 is 126 feet, and is showing some fine ore. A crosscut has been started in this drift to run east to cut the front vein. Peer tunnel No. 3 in in 252 feet. The face is in much softer formation than at any previous time since the tunnel has been started, and is looking very favorable, and from general appearances, I think the vein will soon be encountered.

COLORADO.

MILL RUNS.—Georgetown *Courier*, July 23: The Georgetown tunnel will cut the Sonora in about 30 ft. It makes one's eyes glisten to see the native silver coming out of the Tishomingo. One and a half tons of ore from the Little Giant lode, Red Elephant mountain, returned $676. A earload of ore recently shipped from the Ann Eliza lode, at Chihuahua, returned $4,000. Brophy & Co., on the Scotia, had a mill run of ore last week, which went 126 ounces silver per ton. Snyder & Co., lessees on the Coin lode, had a mill run of 2,600 pounds of 160-ounce ore last week. A mill run of ore from the Gray Eagle, at Chihuahua, worked by George Dinsmore & Co., returned nearly $8,000. A run of ore from the Jordan lode, on Democrat mountain, of 7,814 pounds, returned 116 ounces silver per ton. Swanson & Co., lessees on the Rogers, brought down a lot of ore last week, which milled 179 ounces silver per ton. The Barrett & Fletcher mill, at Empire, is running on a full supply of ore from the Tom Benton, California, Livingston County and Pittsburg lodes. McNulty & Co. intend working the Fred Rogers through the Junction tunnel. They will run on the Rogers vein and connect with the engine shaft. Work will commence this week. Frank J. Hood and Chas. W. Steele have a lease and bond on the Snowden lode, on Griffith mountain. This lode is undeveloped except by three surface workings. A lot of 43 pounds of unassorted quartz milled 143 ounces silver per ton. A mill run from the Stevens mine, made last week, gave the following results: First class, 138 ounces silver and 54 per cent lead; second class, 89 ounces silver and 26 per cent lead. The whole lot, consisting of 39,820 pounds, returned $4,240. The Clifford lode, on Democrat mountain, near the Astor, owned by Fred Candee & Co., is being worked by an adit, which is now in 25 ft. In the breast is shown an average of two inches of ore which assays as high as 2,390 ounces silver to the ton. Captain J. F. Phillips is driving an adit on the Tom Benton vein, at Empire, which has reached the old Shawnee shaft, which he is clearing. There is already exposed a vein of quartz, three ft wide, which runs four ounces in gold to the cord, under stamps. The *Gazette* says that one of the most important strikes that has taken place in that vicinity is that in the Gem mine, on Seaton mountain. It is stated by the owners that they have exposed a large body of from 10 to 12 inches, nearly solid gray copper in the lower workings. Carothers & Keaggy had a run of ore last week from a new strike made by them at Lawson. The ore returned, first-class, 802 ounces, and second-class, 317 ounces silver per ton. This was taken from a prospect hole, ten ft deep. The owners have christened it the Orient.

IDAHO.

BULLION.—Wood River *Times*, July 23: Bullion, which the *Times* very appropriately named "The Backbone of Wood River," three years ago, still deserves that appellation. At the present time its mines are in better condition than ever before, and probably show more ore value than the balance of the mines of Wood River combined. In the bullion there is an ore body that will in all probability and estimating moderately, net over $2,000,000; in the adjoining Ophir claim there is also an ore-body that promises still better. The Mayflower, which adjoins the Bullion on the north, is also showing up more magnificently than ever. The O K vein, which runs parallel with that just mentioned, is in shape to yield large quantities of ore. The Mountain View, owned by Mose Hirschman, Barney Quigg and Judge McBride, is just beginning to make a record that will be second to that of no other mine. The Valley View bard by, and owned by Colonel Pettit, of Atlanta, Frank P. Cavanah, A. J. Haffaker and William Irvine, is also making a good showing. The Eureka, owned by Colonel Wall, is about to have new concentrating and hoisting works, and, six weeks hence, will be yielding all of 10 tons of ore per day. The Idahoan, on the same vein, bas over half a million dollars' worth of ore in sight. The Bates & Boyd shows up over $100,000 worth of ore, gross; and the owners recently refused $60,000 cash for the property. The Bay State, French Boys', and Lawrence & Reilly groups, on the Divide, have good bodies of fair grade ore. And the Narrow Gauge and Bannack group, just over the Divide, is yielding steadily, the jigs working regularly. Taken all in all, Bullion is doing splendidly this year, and will make a brilliant record. Only about 250 miners are employed there now but by the first of September that number will be at least doubled, nor will this increase be temporary. The Bullion mines and concentrating works are now so situated that the season of the year makes very little difference with them. Next winter there will be more men at work, in and around Bullion, than now. "The Backbone" is therefore on the eve of a boom, and a good one, based on the development of the mines and their probable steady yield.

MONTANA.

THE CAPACITY TO BE DOUBLED.—*Inter-Mountain*, July 26: An interview with Mr. Daly, superintendent of the Anaconda Company's works, elicited the information that extensive improvements and additions are to be made to the already mammoth plant of the company in the upper Deer Lodge valley town. The exact nature of the improvements has not as yet been decided upon, but sufficient is known to warrant the statement that the productive capacity of the works will be almost doubled. Mr. Daly will visit the works to-morrow and the matter of the contemplated addition will receive his attention. Much will depend upon the character and amount of the product of the present furnaces, and it is not likely that the additional works will be commenced until it has been fully determined by careful experiment whether reverberatory or blast furnaces will best treat the ore furnished by the mine.

THE BELL SMELTER.—*Inter-Mountain*, July 24: For several months past the Bell smelter has been doing good work. During the month of June the amount of ore treated daily, only one furnace being in operation, averaged 37 tons, or a total of 1,110 tons. This very considerable amount of ore was largely taken from the 400 foot east level of the mine, where it is understood a fine body of excellent ore was uncovered last spring. A considerable part of the ore worked in the smelter is first concentrated in the old Longmaid works, just south of the depot, and goes into the blast furnace with very little gangue. Next month it is in contemplation to run the two blast furnaces, and the daily capacity will then be about 70 tons. The smelter contains two calcining furnaces, each with a capacity of about eight tons. The rest of the ore worked in the blast is desulphurized by heap roasting, which eliminates about 80 per cent of the sulphur. At present the smelter is closed down for repairs, after a long and continous run. The amount of roasted ore on hand at present is not large, though it is stated that when operations are resumed in a few days, 1,000 tons of calcined ore will be available for reduction.

NEW MEXICO

GENERAL NOTES.—Silver City *Enterprise*, July 14: The Williams brothers' patent improved Baldwin hoist has arrived and work will be pushed forward with rapidity upon the Nugget claim in a short time. A contract to do twenty-five ft of work was let upon the Doc Handy mine, in Pinos Altos this week. Another dividend of fifteen cents per share, amounting to a total of $60,000, payable July 15th, has been declared by the Sierra Grande mining company, of Lake Valley. The smelter and reduction plant in this city is now nearly completed. It can be made ready for business in a very short time after the vanners arrive, which are detained by the washouts. The mines belonging to the Plata Verde Mining Company, in Shingle canon, near Georgetown, will be worked in a few days. There are large bodies of low-grade ore in these mines and with a market for it, as is at present afforded the Georgetown mine owners, the property could be made to pay. From all reports the new strikes in the neighborhood of Gold gulch are of considerable magnitude and value. On Saturday evening last on a property in which Cab Conway is interested, a shot was put in which blew out a solid chunk of ore weighing about five hundred pounds, which was fairly "lousy" with horn silver. The owners expect to ship a carload of ore in a few days, and if it comes up to their expectations, regular shipments will be continued after that date. During the past few days development on the Old Man mine at Fleming has been steadily progressing. The ore seams in places have not been as large as nearer the surface, but the grade is much the same. On Tuesday last the seams in the open cut, east side, widened materially, as did the bodies in the other openings. It is the general opinion of persons who have visited the Gold Gulch and Thompson Canon discovcries that they are promising prospects, and will pay big to work from grass roots. The claim in litigation there is said to be very rich in silver and carries some gold. On the Atlantic mine, in Pinos Altos, a four-inch vein of $40 gold rock was discovered by the owners recently. On this mine, which has been prospected and worked for years, there are four distinct veins which traverse the claim from end to end, and which have in the past yielded many thousands of dollars to their owners. Recent development has done much to improve the prospects of this particular group of mines. Robert Kirk, an old and well-known prospector, discovered ore last week at the head of Arroya Questa, about one mile south of Pinos Altos, that may prove to be a big thing. The ledge on top is fourteen inches in width, and average assays give returns of seventy-five ounces in silver. It has not been tested for gold, but the ore will carry a small amount. Development work is progressing upon the property and other prospectors are locating extensions. On the adjoining claim we learn that Moore and Sims have the same mineral.

CHLORIDE CHRONICLINGS.—*Black-Range*, July 24: Jim Wilson is now at work on a fine prospect at Granite Gap in the south end of the range, in which himself and brothers are owners. Messrs. Irish and Dempsey are at work on the middle Palomas on one of the promising claims owned by themselves. McBride and Burke. Major Day reports a new discovery of ore in the Cuchillos in the neighborhood of his German mine, which he pronounces the finest thing that he has struck yet. Foster, Johnson and Nourse are putting their labor upon the Pelican at Hermosa. They are following the ore crevice into the mountain and increasing the ore dump. The tunnel is now 165 feet long. Charley Lewis and Ed. Doran two of the owners of the Palomas Cheif mine, Hermosa, are back from their rambles and are again at work on this promising property, taking out ore and sacking it for market. They had, on last Sunday, 125 sacks of ore on the dump, and the mine is reported to be looking particularly fine. The hoisting machinery for the Silver Monument mine has been lying at Engle for some little time, but owing to the height of the river flood no attempt has been made to get it out here. In a day or two, however, John McBride goes to the railroad to superintend loading the machinery on the wagons and getting the wagons across the river. Henry Westerman has taken a bond lease on the St. Cloud mine which gives him absolute possession and control of the property for one year.

OREGON.

CLEANING UP.—Jacksonville *Times*, July 25: Wimer & Sons of Waldo are cleaning up; so are Desselles & Co. Both claims are expected to pay well. John Beckner informs us that J. T. Layton will finish work for this season in a few weeks. The prospects are favorable. A. T. Johnson and Joe Brændel have discovered a promising quartz ledge in sight of town. A company will probably be organized to work it. Joe Brændel, while prospecting the bedrock in one of the gulches west of town, picked up a nugget of gold worth $17.50; also a few small pieces. One of the best developed and most promising quartz mines in Southern Oregon is that owned by George Schumpf in Willow Springs precinct. A large body of ore is in sight and recent assays prove that all which is required to make this enterprise a profitable one is capital enough to put up a good mill. Mr. Schumpf deserves success for his endeavors to advertise the mineral resources of the county.

BONDED.—Crescent City *Courier*, July 25: J. J. Aiken of San Francisco returned from Kerbyville this week. He is interested quite extensively in mining matters over the divide, and states that his company has bonded the well-known Mackay claim for one year in the sum of $25,000. They have also located two other claims, amounting in the aggregate to about 500 acres, all of which prospect well. There will have to be about 20 miles of ditching in order to put in a water supply for all the year round. He goes to San Francisco and will begin immediate preparations to commence work.

UTAH.

REVIEW.—Salt Lake *Tribune*, July 25: The week has been rather a quiet one, yet the mining activity has been fair. The receipts of bullion and ore in Salt Lake City for the week ending July 23d, inclusive, amounted to $112,708.50 in bullion, and $10,650 in ore. For the previous week the total was $111,844.43 in bullion; no ore. The canyon roads are now in fair condition, and the Alta tramway is open. So the ores may be expected to come down from the hills freely from this time onward. The output of the Horn Silver for the week was 19 carloads of bullion, $57,000, bringing the total for the year to date up to $1,324,000. The Ontario shipped during the week sixty-six bars of bullion, valued at $47,228.50. Total shipments to date for the present year, $918,082.39. The low price of lead gives Bingham rather a solemn air. A hundred tons of ordinary Bingham ore is worth $500 less to the miners than it was six months since. An improvement is expected, however, soon, when the corroders purchase their semi-yearly stocks. At present the tendency is for leasers to reduce their working forces and not crowd their work. The Brooklyn property, Lead and Yosemite are the heaviest producers in the camp, sending their ore down south of main Bingham, part of it by wagon to the smelters. The Brooklyn Company lately purchased the Revere at something like $20,000. They expect to get a bigger mine there than ever. The Ticwaukie is taking out ore 100 ft below the creek level, and has no water. Efforts are being made to open a new mine under the Winnamuck, the old ground having been pretty well worked out and the dump cleaned up. The mine turned out formerly full $1,200,000, and it is believed that such an ore body has deep roots. It has never been worked below the water level. An expenditure of $25,000 would sink a new working shaft to the vein 300 to 400 ft below the creek and demonstrate whether the vein at that depth carries paying ore. The new process of leaching at the Old Telegraph works claims to clean silver ores as by a fire assay and very cheaply. It is expected a large plant will be put in there to work ores by this process, when some of the chief mining and metallurgical men of the company shall have been out and looked over the ground. They are to be in this country shortly. Bingham may yet see more prosperous days than ever. Prof. Morton's mill is approaching completion. The Frisco Consolidated is putting up a small concentrating mill. There is talk of consolidating two or three miles of Lower Bingham gulch, incorporating and raising on Treasury stock $15,000 or $20,000 to run in a bedrock ditch and enable the ground to be worked. It is estimated that the channel of the creek for a width of say thirty ft and a length of 10,000 ft contains on an average $2 in gold dust, lying nearly on the bedrock, for each square foot, equal to $600,000. With a bed-rock ditch (tunnel) 3,000 ft long, costing not to exceed $5 per running foot, this could all be worked out to good advantage. All it requires is some one to take hold of it and do it. In many places there is an old creek channel, at a higher level than the present one, and it is from this that most of the gold has been taken out, and the general opinion as to the yield of the creek channel formed. A good deal of money has been expended in other places in the effort to get out and wash the pay dirt through shafts. But that is not the way to do it. Doubtless there is a rich harvest to be garnered out of that ground whencver it is gone about intelligently. Mr. Kerwin, long manager under Mr. Chambers, at the Ontario mine, has recently paid it a visit. He says it looks exceedingly well everywhere, and especially in the face of the eighth level, going into the new west ground. He says at that point there is two or three ft thickness of 100-ounce ore, which is good enough. Mr. Kerwin thinks it probable that there is enough ore above the tenth level to keep the mill running four or five years. It depends, of course, on how the new ground west opens up. The eighth level, now 300 to 400 ft west of shaft No. 3, and the sixth, driven 200 or 300 ft further, and an upraise from the sixth to the fifth, and a considerable opening on the fifth, comprise all the openings yet made in this new ground. They have been in ore, off and on, not, it is understood, as good as the old mine, but compared with any other mine we know of, very good indeed.

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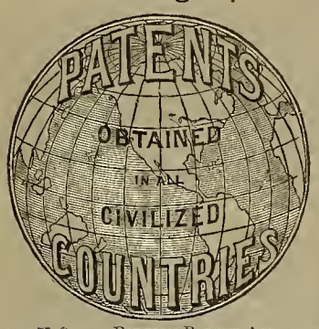

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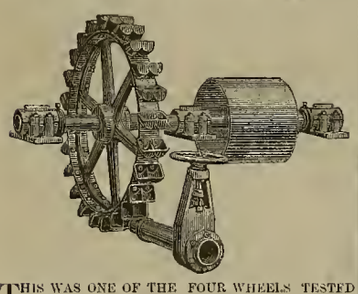

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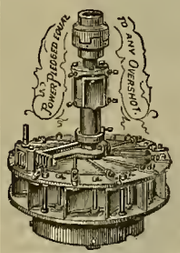

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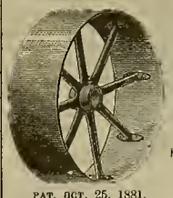

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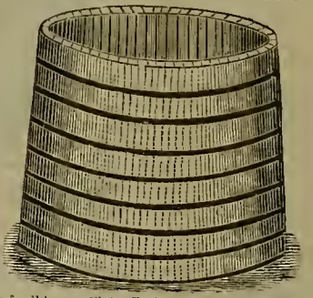

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Mining Share Market.

As our mining stock table show, there has been a reaction in the stock market and the "bears" are in the ascendant. Prices have been broken from their rise of last week. The fluctuations have made some little excitement on the street, to the joy of the brokers. On the Comstock all work is progressing favorably in the leading mines. In the Sierra Nevada they have started their first crosscut east on the 3100 level. This is known as east crosscut No. 1, and is at the north end of the main drift, just opposite west crosscut No. 4. There is nothing new in the deep winze that is being sunk by several north end companies, except that at the bottom there is a gradual increase of porphyry. This porphyry will gradually displace the bastard quartz which now forms the mass of material into which the winze is being sunk, and which blasts badly. In the Gould and Curry and Best and Belcher they are meeting with encouraging changes of material in some of the drifts. A force of men have been put to work on the 2800 level of the Hale and Norcross. The Chollar folks are making good headway, in a favorable formation, with their south drift on the 2600 level. The Yellow Jacket, Crown Point, Kentuck, Belcher and other Gold Hill mines are extracting and milling about the usual quantity and quality of ore.

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ASSESSMENTS.

COMPANY.	LOCATION.	No.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M Co	California	5	1.50	June 23	July 28	Aug. 14	A. Judson	320 Sansome st
Alpha Con M Co	Nevada	18	50	July 16	Aug 21	Sept 10	W Willis	309 Montgomery st
Alaska M and M Co	Alaska	7	1.00	July 22	Aug 26	Sept 16	E F Stone	306 Pine st
Boracic Acid M Co	California	3	05	July 21	Aug 25	Sept 15	H C Droger	309 Montgomery st
Bodie Tunnel M Co	California	9	20	June 30	Aug 2	Aug 20	C C Harvey	309 California st
Best & Belcher M Co	Nevada	30	50	July 9	Aug 14	Sept 2	W Willis	309 Montgomery st
Benton Con M Co	Nevada	13	25	July 22	Aug 26	Sept 15	W H Watson	302 Montgomery st
Cahores M Co	Mexico	19	05	July 18	Aug 22	Sept 22	H C Edgerly	328 Montgomery st
Con Amador M Co	California	7	50	July 21	Aug 21	Sept 10	F B Latham	408 California st
Chollar M Co	Nevada	14	50	July 23	Aug 26	Sept 15	C L McCoy	309 Montgomery st
Champion M Co	California	15	10	June 13	July 17	Aug 6	T Wetzel	322 Montgomery st
El Dorado South Con M Co	Nevada	14	2.00	July 14	Aug 14	Sept 4	D M Kent	330 Pine st
Equitable Tunnel M Co	Utah	30	10	June 29	Sept 15	Oct 7	W A Van Bokkelen	419 California st
Enterprise M Co	California	1	15	July 1	Aug 15	Sept 5	W Van Bokkelen	419 California st
Gould & Curry S M Co	Nevada	48	50	June 6	July 11	Aug 4	A K Durbrow	309 Montgomery st
Humboldt Hill M & M Co	California	1	15	July 15	Aug 19	Sept 5	J Stadtfeld	419 California st
Martin White M Co	Nevada	18	25	July 25	Sept 4	Oct 2	J J Scoville	309 Montgomery st
Mayflower Gravel M Co	California	25	10	July 10	Aug 12	Sept 5	J Morizio	328 Montgomery st
Mammoth Bar G M Co	California	6	15	June 9	July 11	Aug 1	J W Pew	310 Pine st
Mexican G M Co	Nevada	27	75	June 11	July 16	Aug 6	C E Elliott	309 Montgomery st
Mono G M Co	California	21	50	July 8	Aug 12	Sept 1	G W Sessions	309 Montgomery st
North Peer M Co	Arizona	1	2.00	June 12	July 17	Aug. 11	H Deas	309 Montgomery st
Oleta M Co	California	1	5c	July 26	Aug 30	Sept 20	T H Gancard	9th and Market sts
Pittsburg M Co	California	10	05	July 11	Aug 15	Sept 5	C G Brooks	210 Front st
Potosi M Co	Nevada	16	50	July 29	Sept 2	Sept 23	C L McCoy	309 Montgomery st
Peer M Co	Arizona	1	25	June 6	July 15	Aug 5	A Waterman	309 Montgomery st
Real Del Castillo M Co	Mexico	2	20	June 28	Aug 4	Aug 22	A Judson	320 Sansome st
Rainbow M Co	California	11	15	June 16	July 21	Aug 18	P F Mohrhardt	311 Montgomery st
Starlight M Co	California	1	06	June 14	July 18	Aug 6	W Battles	513 Market st
Scorpion S M Co	Nevada	27	10	June 25	Aug 1	Aug 22	G S Spinney	310 Pine st
Utah S M Co	Nevada	49	50	June 19	July 25	Aug 13	G C Pratt	309 Montgomery st
Valapara M Co	Mexico	2	20	June 28	Aug 4	Aug 22	A Judson	320 Sansome st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Columbus Con M Co	Nevada	J M Buffington	309 Montgomery st	Anoual	Aug 12
Derbec Blue Gravel M Co	California	T Wetzel	322 Montgomery st	Annual	Aug 5
Liberty Hill M Co	Utah	A Adler	309 Montgomery st	Annual	Aug 11
Loreto M and M Co	Mexico	H G Jones	327 Pine st	Annual	Aug 7
McMillen M Co	Nevada	J Morizio	328 Montgomery st	Annual	Aug 6
Navajo M Co	Nevada	J W Pew	310 Pine st	Annual	Aug 12
Occidental M Co	Nevada	A K Durbrow	309 Montgomery st	Annual	Aug 11

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	May 15
Bodie Con M Co	California	G W Sessions	309 Montgomery st	50	June 5
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	May 27
Idaho M Co	California			4.00	Apr 2
Jackson M Co	California	D C Bates	309 Montgomery st	10	Mar 16
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 21
Paradise Valley M Co	Nevada	W Letts Oliver	323 Montgomery st	10	Apr 28
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Mar 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Apr 2

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 10.		WEEK ENDING July 17.		WEEK ENDING July 24.		WEEK ENDING July 31.	
Alpha	.70	1.75	1.10	1.65	.85	1.45	1.15	1.60
Alta	1.90	2.15	2.05	3.45	2.60	3.30	2.25	2.90
Andes	.40	.45	.45	.70	.40	.45	.40	.45
Argenta	....	....	....	....	....	....	....	.10
Belcher	.75	.85	.95	1.50	.95	1.15	.90	1.25
Belding	....	....	....	....	....	....	....	....
Best & Belcher	2.10	2.70	2.15	3.50	2.15	2.90	2.30	3.65
Bullion	.40	.50	.65	1.20	.65	.95	.70	.90
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	.65	.75	.35	.65	.55	.60	.50	.60
Bodie Con	2.15	3.50	1.35	2.10	1.50	1.70	1.60	2.20
Benton	.45	.55	.45	.75	.50	.70	.40	.45
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	.50	.75	.55	.50	....	.45	....	.70
California	.25	.30	.20	.45	....	.30	.25	.35
Challenge	....	.20	....	.25	.20	.25	.20	.30
Champion	....	....	....	....	....	.10	....	....
Chollar	2.05	3.10	3.15	4.75	3.70	5.1	2.70	5.00
Confidence	....	....	1.00	1.75	....	1.50	1.15	1.30
Con. Imperial	....	.10	....	.10	....	....	....	.10
Con. Virginia	.25	.35	.30	.50	.30	.45	.35	.50
Con. Pacific	....	.40	.40	.45	....	.45	.45	.50
Crown Point	1.20	4.40	1.40	2.60	1.30	1.50	1.35	1.75
Day	....	....	....	....	....	....	....	....
Eureka Con	....	2.50	2.00	2.50	....	2.50	2.60	2.75
Eureka Tunnel	....	....	....	....	....	....	....	.50
Exchequer	....	.30	.35	.50	.30	.45	.35	.45
Grand Prize	....	.35	.35	.40	.30	.40	....	.55
Gould & Curry	.85	1.80	1.65	2.55	1.75	2.45	2.20	3.70
Goodshaw	....	.15	....	....	....	....	....	....
Hale & Norcross	2.80	4.85	4.20	6	4.75	7.00	3.90	5.00
Holmes	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	.30	....	.25
Julia	....	....	....	....	....	....	....	....
Justice	....	....	.25	.55	.30	.35	.25	.30
Martin White	....	....	....	....	....	....	....	.25
Mono	.30	.65	.35	.40	.20	....	.25	.30
Mexicau	.75	1.10	1.00	2.65	1.95	2.60	2.30	3.15
Mt. Diablo	....	2.00	....	2.00	....	....	....	....
Northern Belle	....	....	....	....	....	....	....	....
Navajo	4.05	4.25	3.75	4.10	4.10	4.20	4.00	4.25
North Belle Isle	....	.20	....	....	....	.20	....	....
Occidental	1.25	1.50	1.35	1.70	1.40	1.50	1.40	1.60
Ophir	.85	1.10	1.10	2.25	1.55	1.80	1.55	2.35
Overman	.20	.30	.25	.40	.20	.25	.25	.30
Potosi	.80	1.30	1.50	2.30	1.80	2.50	1.45	2.75
Pine Con	....	....	....	....	....	....	....	....
Savage	.80	1.15	1.15	1.70	1.30	1.95	1.35	2.40
Seg. Belcher	....	1.50	....	....	....	....	....	2.00
Sierra Nevada	1.05	1.50	1.50	2.50	1.60	2.00	1.60	3.65
Silver Hill	....	.10	....	.10	....	.10	....	.10
Silver King	....	5.00	....	....	4.75	5.00	....	4.95
Scorpion	....	.15	.20	.40	.20	.25	.25	.50
Syndicate	.45	.50	.45	.50	.45	.50	.45	.50
Tioga	....	....	....	....	....	....	....	....
Union Con	.70	.95	.95	2.40	1.70	1.90	1.75	2.70
Utah	.35	.60	.60	1.85	1.00	2.00	1.70	2.65
Yellow Jacket	1.90	2.65	2.35	2.75	2.00	2.25	2.10	2.60
	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange

THURSDAY A. M., July 31.

800	Alta	2.10	
200	Alpha	1.05	
380	Bodie Con	2.20@2.25	
530	B. & Belcher	2.55@2.60	
100	Bullion	.65@.70c	
200	Belcher	1.10	
2400	Benton	.40c	
250	Con. Virginia	.35c	
320	Chollar	2.65@2.75	
500	Crown Point	1.40@1.45	
1100	Exchequer	.35c	
565	Gould & Curry	2.55@2.60	
2225	Hale & Nor	.3.75@4.00	
100	Justice	.30c	
910	Mexican	2.30@2.40	
150	Navajo	3.90	
950	Ophir	1.65@1.70	
400	Overman	.20c	
50	Occidental	1.25	
550	Potosi	1.40@1.45	
800	Savage	1.40@1.45	
755	Sierra Nevada	2.30@2.35	
100	Scorpion	.40c	
250	Syndicate	.50c	
2000	Union	1.90@2.05	
100	Utah	1.70	
100	Yellow Jacket	2.15	

AFTERNOON SESSION.

100	Alta	2.35
400	B. & Belcher	2.90@3.05
500	Bullion	.70c
600	Crown Point	1.35@1.40
830	Chollar	2.95@3.05
1050	Gould & Curry	2.85@3.10
890	Hale & Nor	4.30@4.60
300	Mexican	2.85@2.90
400	Navajo	3.95
600	Ophir	1.85@1.90
720	Sierra Nevada	2.2@2.90
800	Union	2.20@2.40

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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A. S. DENNIS—San Mateo county.
A. C. KNOX—Nevada (State.)
B. W. CROWELL—Fresno and Tulare counties
JOHN H. STURCKE—Santa Clara and San Benito counties.
GEO. MCDOWELL—Nevada and Placer counties.
WM. PASCOE—San Francisco.
WM. H. COOK—Alameda county.

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, July 31, 1884.

ANTIMONY—Per pound	14	@	15
BORAX—Per Pound (extra)	16	@	—
IRON—Glengarnockton	25 00	@	—
Eglinton, ton	24 00	@	—
American Soft, tou	27 00	@	—
Oregon Pig, tou	—	@	—
Clipper Gap, Nos. 1 to 4	30 00	@	32 00
Clay Lane White	23 00	@	—
Sholts, No. 1	26 00	@	—
Refined Bar	3½	@	3
Boiler, 1 to 4	5 00	@	5 50
Plate, 5 to 10	4½	@	4¾
Nai Rod	7½	@	—
Norway, according to thickness	6½	@	7
STEEL—English Cast, lb	14	@	15
Black Diamond, ordinary sizes	14	@	15
Drill	15	@	—
Machinery	12	@	14
COPPER—Ingot	22	@	—
Brazers' sizes	32	@	—
Fire-box sheets	28	@	—
Bolt	25	@	28
Old	12½	@	15
Bar	—	@	—
Cement, 100 fine	12	@	—
LEAD—Pig	4½	@	—
Bar	5½	@	6
Pipe	7	@	—
Sheet	8	@	—
Shot, discount 10% on 500 bags: Drop, ½ bag	2 00	@	—
Buck, ½ bag	2 20	@	—
Chilled, do	2 40	@	—
TIN PLATES—Charcoal	6 00	@	6 50
Coke	6 00	@	—
Banca tin	22	@	23
I. C. Charcoal Roofing, 14x20	6 25	@	6 50
ZINC—By the casks	19	@	—
Sheet, 7x3 ft. 7 to 10 lb. less the cask	9	@	10
NAILS—Assorted sizes	3 25	@	—
QUICKSILVER—By the flask	29 00	@	—
Flasks, new	1 05	@	—
Flasks, old	85	@	—

Bullion Shipments.

Paradise Valley, July 23. $4,578; from Nevada City mines for month of June, $92,000, by Wells Fargo & Co., and $20,000 by private hands; Stormont, 22, $3,340; Nevada ore, 22, $1,850; Horn Silver, 22, $12,000; Ontario, 22, $12,125; Hananer, 23, $2,600; Horn Silver, 23, $9,000; Hanaucr, 24, $2,450; Crescent, 24, $3,350; Horn Silver, 24, $9,000; Ontario, 24, $10,284; bullion from Salt Lake City, for week ending July 23, $123,358; Horn Silver, 26, $9,000; Ontario, 26, $1,054; Hanauer, 26, $8,450; Crescent, 27, $3,600; Ontario, 27, $5,725; Horn Silver, 27, $12,000.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First street, a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below costs, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. References as to above can be had upon applying to this office.

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The next year will begin on Wednesday, July 30, 1884.
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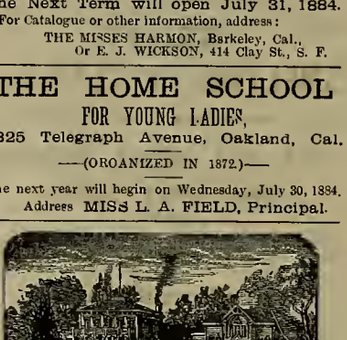

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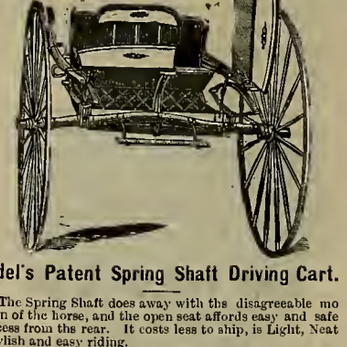

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.]

FOR WEEK ENDING JULY 22, 1884.

302,317.—SAW-TOOTH—John J. Bowen, S. F.

302,488.—IRRIGATING AND DRAINING LAND—Luther M. Holt, Riverside, Cal., and C. N. Earl, Los Angeles, Cal.

302,338.—CONSTRUCTION OF BUILDINGS—Peter H. Jackson, S. F., Cal.

302,339.—STAIRS FOR BUILDINGS—Peter H. Jackson, S. F., Cal.

302,341.—SIDE-HILL PLOW—Ira B. Kilgore, San Jose, Cal.

302,343.—PIPE-JOINT AND COUPLING—John C. Kilton, S. F., Cal.

302,347.—SULKY CULTIVATOR—Neil McLean, Watsonville, Cal.

302,348.—DEVICE FOR OPERATING DOORS AND GATES OF ELEVATOR HATCHWAYS—Thos. H. Melrose, S. F., Cal.

302,615.—PEA SHELLING MACHINE—Felice Molini, S. F., Cal.

302,350.—ORE CONCENTRATING APPARATUS—Frederick Morris, S. F., Cal.

302,354.—SHEEP SHEARS—Samuel D. and D. E. Paxton, and A. Mahurin, Ukiah, Cal.

302,355.—BALING PRESS—Jacob Price, San Leandro, Cal.

302,357.—GRAIN SEPARATOR—Lovell A. Richards, Grayson, Cal.

302,359.—WAGON BRAKE—Thomas J. Sparks, Oroville, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

GANG PLOW.—Robert Hendricks, Woodside, San Mateo Co., Cal. No. 301,985. Dated July 15, 1884. These improvements consist in the arrangement of the plows in front of the wheels and seat, in the means for throwing them to one side on sidling ground; in a means for changing the inclination of the plows, and in certain other details of construction.

GRAIN SEPARATOR.—Lovell A. Richards, Grayson, Stanislaus Co. No. 302,357. Dated July 22, 1884. It consists in certain improvements in connection with the straw-carriers whereby much of the grain which is usually carried off with the straw, and is discharged over the end of the machine, is separated and saved, being returned to the shoe.

SULKY CULTIVATORS.—Neil McLean, Watsonville, Santa Cruz Co. No. 302,347. Dated July 22, 1884. This sulky or orchard-cultivator consists mainly in certain details of construction embracing the connection of the frame with the wheel axle, the attachment of the teeth or shovel-shanks to the frame, an extension arm with a hinged tooth, a peculiar construction of the teeth or shovels, and certain details of construction.

HYDRAULIC ELEVATOR.—Albert F. Knorp, San Francisco, No. 302,003, dated July 15, 1884. This invention relates to certain improvements in that class of elevators in which the cage or platform is supported on the top of a vertically-moving column or piston rod, which is forced up to elevate the cage by a column of water; and it consists of a means for holding the sections together which form the column, and preventing their separation in case the joints become broken or detached. Binding rods extending top to bottom in the interior are so fixed that even if the column should separate it would not fall or produce a serious accident.

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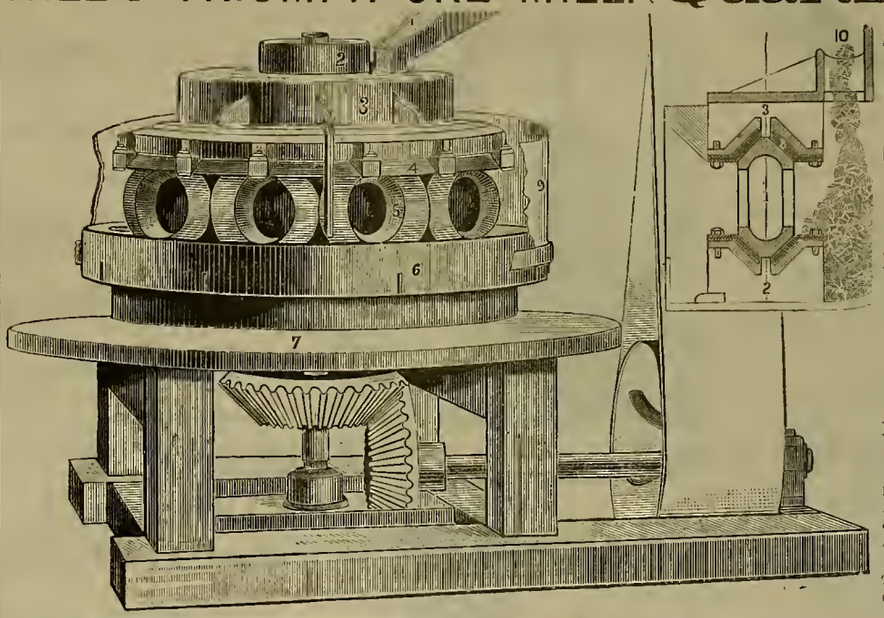

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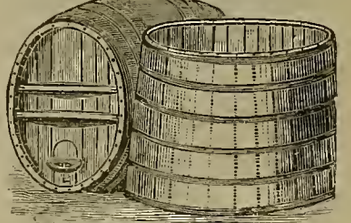

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Gould & Curry Silver Mining Company.
ASSESSMENT No. 48.

Levied	June 1884
Delinquent	July 11, 1884
Day of sale	August 4, 1884
Amount	Fifty cents per share.

ALFRED K. DURROW, Secretary.

OFFICE—Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

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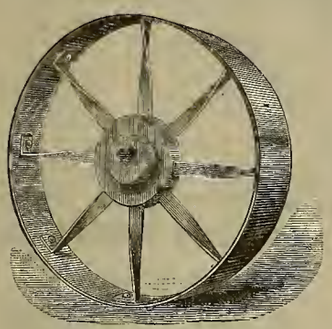

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Yours faithfully,
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[Signed:] RICHARD T. MARSH, Managing Director.

Risdon Iron & Locomotive Works,

Sole Manufacturers and Agents for the Pacific Coast,

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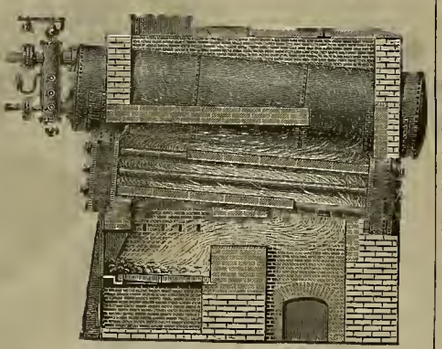

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TESTIMONIALS.

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ANHEUSER-BUSCH BREWING ASS'N

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To Mr. H Heine, Civil Engineer: In reply to your inquiry of September 2d, we respectfully inform you that the three boilers built under your patents, under steam since September 25, 1881, at the Alexander Place Depot, as well as the two at Friedrich Strasse Depot, under steam since September 22, 1882, have given good satisfaction, requiring no repairs whatsoever to date. The internal cleaning of the boiler was always accomplished with ease on account of the convenient arrangement of the tube caps, the adhesion of scales being fully prevented thereby, and the boilers kept in prime condition.

(Signed): BRAUCKE.

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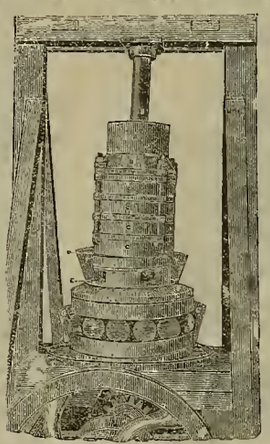

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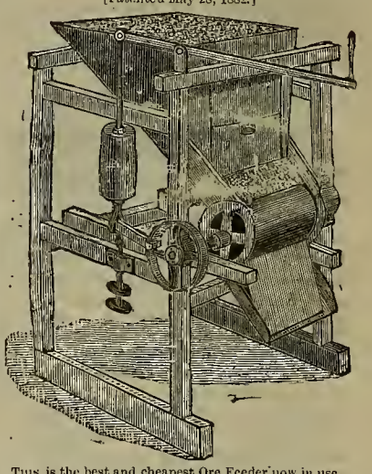
[Patented May 28, 1882.]



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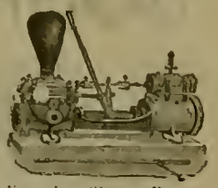

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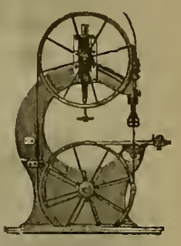

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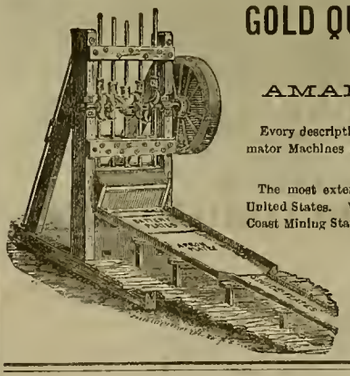

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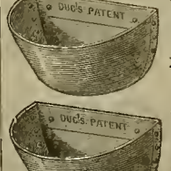

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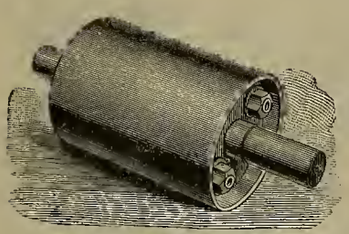

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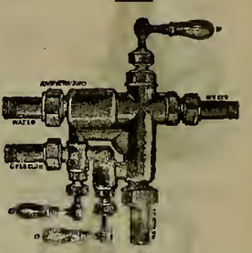

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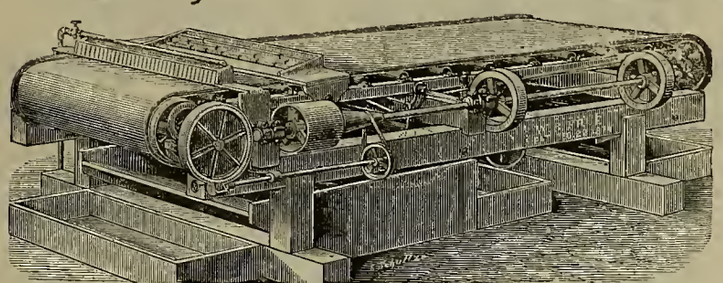

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That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

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January 3, 1884.

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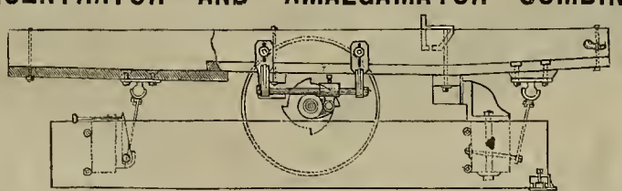

This machine requires less power, less care or attention, and is less liable to get out of repair than any Concentrator now in use. All of which any practical miner will comprehend when seeing it in operation.

The wear and tear is nominal, and the construction so simple that any miner can put it up and run it, and the low price brings it within the reach of all millmen, as it will save enough to pay for itself in any mill in a very short time. One machine will concentrate the tailings from a five-stamp battery.

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☞ Assays and practical working tests made of ores.

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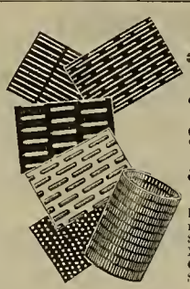

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Sheet Metals of all kinds perforated for Flour and Rice Mills, Grain and Malt Driers, Furnaces, Chess, Cement and Smut Mills, Separators, Revolving and Shot Screens, Stamp Batteries, and all kinds of Mining and Milling Machinery. Inventor and manufacturer of the Celebrated Slot Cut and Slot Punched Screens. Mining Screens a Specialty, from No. 1 to 15 (fine).

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Having sold my interest in the EMBREY CONCENTRATOR to the Frue Vanning Company, I offer for sale at cost a few I have on hand to close the business.

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Fifth and Tasker Sts., PHILADELPHIA, PA.

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MINING AND SCIENTIFIC PRESS.

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VOLUME XLIX Number 6.

Dry Crushing Silver Mill.

The accompanying cuts represent a dry crushing silver mill of forty stamps and eighty tons crushing capacity per twenty-four hours, as built by the Risdon Iron and Locomotive works of this city. This mill is intended for all base silver ores, where desulphurizing and chloridizing is necessary for amalgamation. It contains all of the latest improvements in cylindrical roasting furnaces and rotary dryers: also the Boss continuous process in pans and settlers and quicksilver apparatus. The engines and boilers are of the latest type and especially constructed for a mill of this kind.

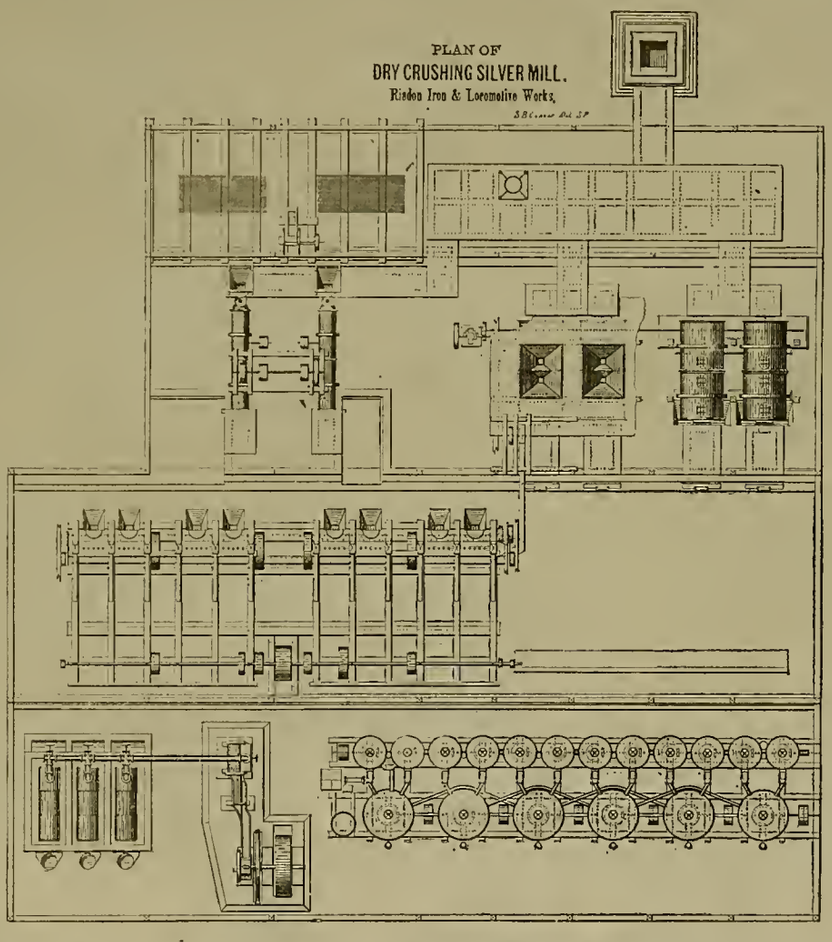
As will be seen from the cuts (the plan on this page, and cross-section on page 85), the ore is brought in at the upper part of the mill, where it is dumped on to the "grizzlies" or screens, made of bars of iron, ¾¾ inches, and set on edges 1½ inches apart, and inclined so as to allow the coarser rock to run to the lower end on to a platform, while the finer goes through into the ore bin. The coarse rock is then run through the rock-breaker (which stands in position where the coarse rock lands, after having passed over the grizzly), and into the bin with the fine rock, from which it is drawn into the self-feeders, and passed through the continuous discharge rotary dryers, which are arranged to discharge into cars, from which the dried ore is dumped into the battery feeders and is crushed. It is then carried by screw conveyors to a bucket elevator, and there raised to a bin above the roasting furnaces, from which it is drawn into cars and weighed, and then put into the hoppers over the furnaces, where the proper chemicals can be added, and the charge prepared for desulphurizing and roasting.

The furnaces are started and stopped by an improved arrangement of friction clutch, made only by the Risdon Iron Works. The furnaces are also made with all of the latest improvements in running gears, charging doors, sampling doors, dampers, etc., sheetiron fireboxes, and cast steel track-rings and rollers, making them both economical and durable, while at the same time they are well adapted to all kinds of roasting ores.

The furnace charging-doors being opened, and the furnace revolved to its proper position so that the doors come directly under the chute-doors of the hopper, it is stopped and the charge run in, when the doors are closed and the furnace started and kept running until the ore is thoroughly desulphurized and chloridized, when the discharging doors are opened and the furnace revolved until the ore is out, when another charge is put in as before. The whole time required for discharging and charging is from five to ten minutes. As seen by the cut, the furnaces are discharged at the end door into a chute which runs under the fire-box, where the ore can lay and be drawn off at leisure and spread out on the cooling floor directly in front and below. From there it can be conveyed by a screw conveyer to the first pan, water being introduced just before it enters it. There are pipe connections between all the pans and between all the settlers, and the pulp passes through all the pans from the first to the last before it goes to the settlers, receiving a continuous treatment and meeting with fresh quicksilver in every pan.

If necessary a different treatment may be pursued in different pans, according to the judgment of the mill superintendent. After the ore has passed all the pans it passes through all the settlers, from first to last.

It has been demonstrated that this process of working ores is very effectual, and makes a great saving in expense. It does away with a large amount of dust and dispenses with the labor of charging pans. There is less liability of loss of quicksilver, in consequence of the pulp passing through so many pans and settlers in succession. The process of amalgamation can be watched at every pan, and any defective amalgamation can be remedied before the pulp passes out of the last pan to the settlers.



MESSRS. GODBE & HAMPTON are preparing to leach the Raymond & Ely tailings at Bullionville. There are 80,000 tons of them. They had been run through the mill once and the lead taken out of them and smelted. It is proposed now to leach out the gold and silver, and it is expected to be done so as to leave a good margin for profit.

Precipitate.

There is a steady increase of the quantity of copper precipitate shipped from the mines which produce pyrites in Spain and Portugal. At these mines, among which are the Rio Tinto, Tharsis and San Domingo, a small proportion of high-grade ore is smelted into regulus direct; the medium grade, running about 3.5 to 4 per cent of copper (wet assay) is shipped as such, while all the low-grade ore is treated on the spot by roasting enormous quantities in heaps, leaching, and precipitating the copper with scrap iron. The resulting copper, called precipitate, is an impure metal, running from 50 to 70 per cent. Efforts have been made in the past few years to replace this crude process, with the drawback of the injurious effect of the sulphurous acid fumes upon vegetation and its enormous consumption of scrap iron, by the Doetsch and Derby method, which extracts the copper from the crude ore direct. This promises to solve the question which threatens the life of the pyrite mines. It dispels the hopes of the Spanish and Portuguese miners that by a gradual decline of their market with sulphuric acid makers, they would be checked in their steady advance as copper producers. It is difficult to arrive at the amount of precipitate imported into England because returns do not show the relative amount of precipitate and regulus.

Copper Pyrites.

The demand in England for copper pyrites has been lately subject to considerable fluctuations. The business is one which has, during the past year, been agitating copper producers in the country considerably. For some years, Canadian pyrites have been coming in, and more recently pyrites from New Foundland and Spain, and it has been feared the copper extracted from them would seriously affect our markets. Such pyrites are beginning to be used by our sulphuric acid makers, as a substitute for imported brimstone, which is consumed by them, at the rate of 100,000 tons a year. To supplant the latter entirely, 200,000 tons of pyrites a year would be needed. The average contents of the pyrites imported into England is a portion higher than 2.5 per cent, and the extreme limits of the copper contents, admissable for good working in pyrites kilns, is placed at five per cent. Assuming that the average of pyrites imported into the country would be 3.5 per cent, a general change of its present method of producing sulphuric acid from brimstone to the burning of pyrites, would carry into the country 7,000 tons of copper, assuming that there were no less in treatment. It is not likely that any other but the acid works on the coast would avail themselves of the cupriferous material, so that only a portion of the total demand could be covered this way.

In the last government report on mineral statistics, it is stated that there are now in this country, six works actually using pyrites, and with their present plant, and the ores they are working, they do not properly produce, at a rate greater than two or three million pounds of copper. One of them has adopted the European plan of leaching, and in fact is regarded as a plant to afford one of the Spanish mines an outlet for a portion of its product. The others follow the successful practice of smelting the cinders (after burning off the sulphur in kilns), in water-jacket furnaces, at a cost sometimes, as low as $1.75 per ton. The handling of large bodies of cinders is thus avoided, a small quantity only of concentrated matte being shipped to the copper works when the metal is extracted.

CARLISLE, NEW MEXICO.—A correspondent, "B. F. R.," sends us this item: The Carlisle mine is working a larger force of men now than ever before, being about a hundred miners and probably sixty to eighty outside. There is in course of construction a large smelter, which will be completed this season. Everything is running on full time. There has been quite a rush to this camp for some time, and the consequence is there are many who come and go without obtaining employment; consequently there are many reports afloat that would not be, if miners would use a little discretion. This camp, which is in Grant county, is one of the best in the Territory.

SACRAMENTO citizens are taking steps to clean the city and make it epidemic proof.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Placer County Notes.

EDITORS PRESS:—Howard Hill, half a mile east of Ophir, is down 50 feet on free milling quartz rock having a width of from 12 to 18 inches which works from $20 to $30 per ton. The ore is galena and sulphuret of iron. The hoisting is done by an overshot water-wheel 24 feet in diameter with pump and friction gear for hoisting on one side, with arrangements on the other side for a two-stamp mill now in course of erection to be attached. Mr. Hill has about 20 tons of fine looking ore on the dump.

There is a general revival of prospecting going on around Ophir.

Chas. Reed is prospecting on West Hill.

Mr. Milton north of town.

Jim Wirm still pushing ahead in his tunnel on Brush feuce ledge.

Hooper & Norton at head of Baltimore ravine, are now erecting a 16-foot overshot water-wheel and putting in four inch pump. Intend, as soon as water is pumped out of the shaft to erect a five-stamp mill on claim. Ledge one and a half to two feet wide. Rock works over $20 per ton.

Frank Laveling has just let a contract for 80 feet of tunnel for prospecting in the direction of Newcastle. M.

A Small Locomotive.

EDITORS PRESS:—Mr. A. M. Davison, Agent of the C. P. R. R., at Cold Run, Placer Co., has constructed a small locomotive about thirty six inches long including tender, corresponding in all respects with an ordinary eight wheeler engine. Driving wheels are about six inches in diameter; connecting rods of brass; cylinders are brass; diameter of pistons one and three-eighths inches, with a stroke of two and one-half inches; boiler of copper, with flues and fire-box same as in large engine; wood burner; built of metal—copper, brass and iron; cab of wood; all the proportions of a large engine are preserved. A small passenger coach about three feet in length is attached. A good deal of power is developed by using a small flat car on which one of his children can sit, and the engine draws them around in fine style. Under a good head of steam the engine will represent a rate of speed of forty miles an hour, of a large engine. Mr. D. was about two years in constructing it, putting in spare time. It attracts a good deal of attention from those of the traveling public, who have the opportunity of seeing it in operation. The engine and cars run a circular track of about 200 feet in length, having a gauge of six inches. M.

THE SILVER KING.—This mine is probably more extensively known than any other on the continent, outside of the Comstock, partly owing to the romantic events attending its discovery, and partly to the wonderfully rich specimens of native silver which it has yielded. Judged by the dividends it has paid, it does not rank very high and even these have ceased for the past year. There is considerable mystery surrounding the present condition of the mine, but it seems to be generally conceded that the bottom has been reached, although there is a quantity of good ore yet to be mined in the upper levels. Sinking has been suspended at the 800 level. The Mowry Company, which has sunk over 1,000 feet just outside of the King line and drifted under the King has also ceased operations. We hear that an attempt is being made to dispose of the mine to an English company. If it is so it may be safely inferred that the begining of the end has been reached, as so valuable a cow as this has proved is not often sold until she begins to run dry. The mine has always been more or less of a close incorporation, having been worked in a manner that must be very satisfactory to Col. Barney, the chief owner, if not to the rest of the stockholders. —*Quijotoa Prospector.*

THE BELMONT MINE is coming to the front as one of the best mining properties in Eastern Nevada. Never in the history of this mine was there so much rich ore exposed as at present, and, in consequence, the force of miners has been increased. Under the able management of Superintendent N. C. Fassett, the work of development in the southern portion of this property, which is all virgin ground, is pushed with great vigor. All the stopes are showing rich ore, and this mine was never in a more prosperous condition than at present. The face of the drift is still in good ore, and the prospects at this point are most encouraging, and it is firmly believed that the ore body is continuous. The ledge carries chloride and black metal ore; measures all the way from three feet to four feet, five inches. The capacity of the leaching works has been doubled, and the capacity of the cooling floor has been quadrupled; and it will not be long before the old Belmont will turn out and ship bullion in good quantities. The plucky owners of the Belmont mine have now the greatest assurance that their labor will be rewarded in time.—*Belmont Courier.*

Vermilion Manufacture.

The following article is taken from Mr. Christy's translations of a brochure on the Imperial Quicksilver Works at Idria, Krain:

In the oldest times of the existence of the present works, vermilion was manufactured. In the beginning it was merely pure, pulverized, cinnabar ore, then later it was a product made by sublimation from this substance; and there were formerly other works for vermilion manufacture than those for quicksilver production. When the Venetians and Dutch began to produce better wares, the production here sank steadily.

The researches of Christofoletti, 1681, and of Baron Richtenfels, in 1726, for the improvement of Idrian vermilion, met with as little success as those of some Venetian women—1740–1741—who had lost their husbands in the Venetian works and had offered themselves to manufacture vermilion according to the Venetian method.

After Haequet had strongly urged the manufacture of vermilion, Oberhuttenmeister Ignaz v. Passetzky succeeded, with the Dutchman Gussig assisting him, in making beautiful cake cinnabar in 1782, and in 1785 vermilion also, in the newly built works on the right bank of the Idriza.

In 1796 Oberbuttenverwalter (manager of the works) Leopold v. Passetzky introduced the sublimate and precipitate manufacture, but it was abandoned as unprofitable in 1824.

The many foreign attempts to manufacture vermilion in the wet way caused similar ones here, as those of Fabriks-Controlor Rabitsch in 1838, and latter of Huttenverwalter M. Glowacki, which brought larger amounts of the vermilion so manufactured into the market. Still this manufacture came to no full development, and became forgotten until, finally, in the years 1877 and 1878, experiments led to its being discontinued on account of its costliness and uncertainty of the method. A new set of experiments in 1878 and 1879, by Assayer E. Teuber and Director of Works (Huttenverwalter) H. Langer, under the direction of the Imp. Agricultural Ministry, led to favorable results. A new manufactory, set in operation in 1880, furnishes three sorts of vermilion manufactured in the wet way.

The arrangements of the works for the manufacture of vermilion in the dry way consists of: One sulphur stamp battery. One amalgamating plant with eighteen small barrels, both pieces of apparatus being driven by a two-horse-power water wheel. Four sublimation furnaces each with six retorts of cast-iron. Four vermilion mills, each driven by a water wheel of 2.5 horse power. Kettles and vats for heating, digesting and refining the ground cinnabar. One drying hearth. The preparation of vermilion, as an article of commerce, falls into several separate operations, viz:

1. Almalgamation; *i. e.*, preparation of the raw Mohr.
2. Sublimation; *i. e.*, preparation of the cake cinnabar.
3. Griuding of the cake cinnahar, refining and drying of the vermilion.

For the preparation of the raw Mohr for each charge of eighteen kegs there are taken 80.64 kg., powdered and sifted sulphur, and 423.36 kg., of quicksilver.

The amalgamating kegs each contain twenty-eight kg. of the charge, and are given intermittent rotating motion by a rack and pinion driven by a water wheel. After, on an average of two and three-quarter hours, the amalgamation is complete and the raw Mohr is taken from the casks.

For the sublimation four furnaces are used, each with six pear-shaped cast iron retorts of considerable thickness. Each is charged with fifty-eight kg. of Mohr, the mouth covered with a loosely-placed sheet-iron helmet, the furnace being slowly fired; the combination of the sulphur and the quicksilver then results in about fifteen minutes, with a detonation. As soon as this operation (das Abdampfen) is over, a clay helmet is placed over the retort and the firing is increased so that after two hours and twenty minutes, the exeess of sulphur evaporates from the tube. The condenser is now added (Stuckperiode Cake-period) and luted then the firing is still more urged, whereupon the cinnabar volatilizes and deposits itself upon the glazed earthernware condensation apparatus (tube, helmet, etc.). After four hours the sublimation is complete, and there is furnished by the helmet 69 per cent., by the tubes 26 per cent., by the coudenser (Vorlage) 2 per cent. cinnabar.

The grinding of the cake cinnahar takes place in four mills driven by an undershot water wheel. These mills have a fixed under and movable upper stone, and the grinding is done with water. The vermilion which leaves the spout and runs into glazed clay vessels has a temperature of about 38° C., that of the air being 15° C. The millstones make forty revolutions per minute, and after each passage of the charge are placed nearer together. There are three sorts of vermilion manufactured:

H. R: high-red vermilion
D. R: dark-red vermilion.
C: Chinese vermilion.

From the mill the cinnabar undergoes the refining, which consists in digesting the cinnabar in potash lye.

As soon as the cinnabar charge has settled in the refining vat, the solution is drawn off and the cinnabar is washed with water until the water runs off perfectly clear. The pulpy mass is placed in glazed drying vessels and dried.

The dry vermilion is then sifted and packed. The greater part by far of the vermilion, as well as cake cinnahar, is packed in tanned sheepskin in packages of 12.5 kg., of which a pair are placed in a wooden keg. Only a small part of the vermilion comes in boxes of 0.5 kg., which again are packed in larger boxes of twenty-five and fifty kg.

California Iron.

From an interview with Irving M. Scott, of the Union Iron Works, in the *Chronicle*, we make the following extracts, which impart some information concerning the iron interests of the State: "The furnace plant at Hotaling, Placer county, has a capacity of about 30 tons a day. The fuel used is charcoal, of which there is consumed about 100 bushels to the ton. With other expenses of manufacture, it costs there about $18 per ton. The tariff is $6 75 per ton. The selling price of pig-iron is about $25. The freight to San Francisco is $2 75 per ton, which, added to $18, the cost, makes $20 75. There are 177 men employed, and they distribute in the county of Placer about $12,000 dollars a month.

"There are great numbers of iron deposits in the State. There is splendid iron ore found in Sierra valley, in Shasta, near Napa, in the neighborhood of Sonoma, not far from Los Angeles, in San Bernardino county, and elsewhere in the State. There are also great deposits in Oregon and Washinton. There is plenty of ore everywhere, but, unfortunately, a lack of fuel. The iron interests of California have much to prevent their rapid development, and need all possible encouragement.

"There is the Oswego furnace at Portland, Or., which has been closed for some time. It has been in existence several years. When iron is $30 a ton it makes a profit, but when it is $25 it comes out about even. Pig-iron is made there with charcoal. The reduction or abolition of the tariff on pig-iron would have the effect of permanently ruining that enterprise.

"There are 225 men employed there. These two are not, however, all the furnaces on the coast where pig-iron is made. There is an iron company at Irondale, on Puget sound, owned and operated entirely by San Francisco capital. Their works are located in a large bank of ore known as bog ore, in the midst of dense forests. A portion of it they bring from Texadra Island. They have not yet manufactured enough with their improved facilities to know the exact cost per ton of the pig-iron they produce.

"At present not one pound of boiler iron-plate suitable for shop work is made on this coast; but the California Iron and Steel Company are putting up a 'blowery' for the purpose of manufacturing plates, or making the 'blooms' out of which plates are rolled. Any reduction of the tariff that would affect the manufacture of iron would seriously affect the manufacture of plates. Of course all this represents a beginning, but it means the birth of many new industries and the opening of many new avenues of labor. We want to keep the money that is being constantly sent East or abroad in our pockets and circulating among ourselves. We want to see our workingmen kept busy. When it is no longer necessary to send east of the Sierra for any of the articles that we need for our daily use, then the transportation question will have been settled forever. Then it will not be so much a matter of what we receive by rail as of what we send away. Then the railroads will be obliged to carry *from* San Francisco a thousand miles in any direction as cheaply as they now carry the same distance from Chicago or New York."

MINERAL HILL.—A correspondent of the Eureka *Sentinel* writes as follows from Mineral Hill, Nev.: During the early Spring it was confidently expected that leaching works would be erected here this summer, but for some unexplained reason, this much-to-be-desired improvement will not be consummated this season. The mill has been operating on tailings for six weeks or more, and is said to be producing more satisfactory results than during any previous run. Seven bars of bullion is the product for the present month. The works are now closed for a general clean-up, but will resume operations in a few days. It is proposed to keep running until winter, and, perhaps, then, if the weather is not too severe. Only a few men are employed in the mines of the company, but those few are all working in ore of a high grade. The battery will probably be dropped later on, when this ore will be run through, and add materially to the bank account of the owners. But few other mines are working on the hill at present. The Hartford and a few other small mines are still producing some good ore, while the Swallow, which held out such promises a month since, seems to be under a cloud. The managers of the furnace near Palisade became interested, in some way, in the latter-named property, and for a month or more have had men working and sorting the old dumps. Considerable of this ore was recently shipped to the furnace, since which time but little has been heard from the management, and the wherewithal to reimburse the employers has not been forthcoming. As a result of this apathy, on the part of the managers, the mine is now idle. Frequent letters of inquiry to find out why this is thus failed to elicit any response from their employers, and sundry expletives are heard in highways and by-ways which are more forcible than elegant, and seem to portend a coming storm.

Crystallized Gold in Prismatic Forms.

Near Clancy, on Clancy Creek, Jefferson County, Montana, minute crystals of gold occur which present the novelty of a solid octahedral nucleus, or head, with a long divergent brush-like or prismatic development of the gold on one side, or angle, giving the whole the appearance of the drawings usually made to represent comets. The total length of these crystals does not exeeed from two or three millimeters (about one-eight of an inch), and the minuteness of the cross-section of the delicate divergent prisms makes it extremely difficult to determine their form. They are, also, very brittle, and they cleave or break asunder in planes at right angles to their length. Under the microscope these prisms are seen to have three or more plans and they appear to be hexagonal. They taper gradually and uniformly to a sharp point, and are sometimes composite, being for part of their length formed of two or more prisms joined side to side.

Among the fragments, one larger and broader than the others exhibits a solid octahedral nucleus with a flat or plate-like projection on opposite sides. This projection shows distinctly on one side a line of composition through the center, with divergent lines or markings at an angle of 45° with the medial line of composition, is slightly trouth-shaped, being formed of two plane surfaces inclined towards the medial line. The opposite side is rough, with angular projections.

These plate-like projections from the octahedron are much larger than the prisms, but it is probable that the origin and crystallization of both are similar. The plates have the appearance of being formed by the combination or twinning of octahedrons parallel with their faces with their main axes inclined towards each other at an angle of 60°.

Hexagonal Prisms of Gold.

At Sonora in Tuolumne County, California, I obtained some years ago from the late Dr. Snell a sample of very small but brilliant prisms of gold. Under the microscope these are seen to be hexagonal prisms with smooth and brilliant planes and terminated at one or both ends with a pyramid. They appear to be well formed crystals without marks of composition or twinning. The basal plane is also visible. The angle between the prism (*I*) and the pyramid (1) is approximately 130°, by measurement kindly made for me by Professor E. S. Dana. They resemble the prismatic gold crystals figured by Professor A. H. Chester, and obtained artificially by digesting gold amalgam in nitric acid. He obtained 136° for the angle $O \wedge 1$, which would give 134 for $I \wedge 1$. It is possible that the Sonora crystals are also artificial, but there is no means of verifying their origin. Similar crystals obtained at Angels Camp in the same region were said to have been taken from a cavity in quartz.

The crystals described by Professor Chester contained 9 per cent of mercury. Le Sage, a writer of the last century, 1777, also mentions prismatic crystals of gold obtained by heating the amalgam. He describes them as square prisms with terminal pyramids of four planes, and considered them to be lengthened octahedrons.—*Wm. P. Blake in Journal of Franklin Institute.*

CUMMER ENGINES.—The 250 H. P. Cummer engine just started in the Amoskeag Cotton Mills, Manchester, N. H., has attracted the admiration of all in that vicinity, and is looked upon with a great deal of pride by the owners and manufacturers. During the past week the Cummer Co., have made the following shipments: A 55 H. P. engine, with outfit complete, to the Goshen El. St. Co., Goshen, Ind.; one of 120 H. P. to Louie Mitchell, Wausan, Wis.; a 130 H. P. engine to C. B. and D. H. Gowan, Canal Winchester, O.; one of 55 H. P. with complete outfit, to A. Dietly and Son, Moorheadville, Pa.; and a 250 H. P. engine to I. P. Evans & Co., Indianapolis, Ind. The Cummer Engine Co., have just started one of their ice and refrigerating machines in the plant of the Robt. Portner Brewing Co., Alexandria, Va., and another in the brewery of Albert Ziegele & Co., Buffalo, N. Y. This is the second Ballantine ice and refrigerating machine furnished the Ziegele Co., and the makers consider it a strong endorsement of their machine. The Cummer Co. have just completed the erection of two of their refrigerating machines in the plant of the Co-operative Brewing Co., Buffalo, N. Y., and expect to ship another ice machine and four more engines this coming week. They report a very flattering outlook for their business, and that they are running to their capacity on ordered work.

THE promoters of the proposed American exhibition in London have been earnestly at work during the past few weeks, and the success of their exertions is shown in the composition of the "Council of Welcome," which has just been announced. The Board comprises some of the most influential peers and public men in England.

THE assessment roll of Shasta county for the present year stands as follows: Real estate and improvements, $2,123,685; personal property, $1,334,113. Total, $3,457,798, being an excess over last year of $1,079,676.

THE Piute pow-wow recently held at Wadsworth, Nev., broke up in a row over the election of a chief to succeed the recently deceased Winnemucca. A deadlock ensued and no chief was elected.

MECHANICAL PROGRESS.

A New Process of Steel Making.

A patent has recently been granted to Mr. W. A. Otto Wuth, of Pittsburgh, for a new process of producing steel from wrought iron with plumbago, the steel produced being, it is claimed, of a high grade and substantially free from sulphur and phosphorus, and containing a definite percentage of carbon. The process consists in making the steel from wrought iron that is practically free from phosphorus, sulphur and carbon, by melting it on an open hearth in contact with a form of carbon which will not oxidize at the heat necessary to smelt the iron, but which will unite with the iron at that heat. Any wrought iron which is sufficiently low in phosphorus may be used as the basis of this process, though muck bar made according to a previous patent of Mr. Wuth he preferred as being especially pure. The decarburized iron of the requisite purity is first cut into pieces of convenient length, and placed in the hearth of the furnace in layers piled one above the other. Between each layer of iron is spread a thin stratum of plumbago, preferably in a pulverized condition, although it may be used in lumps. For this purpose the inventor employs the plumbago of commerce, but of good quality, containing about 98 per cent of carbon and 2 per cent of silica, with a trace of iron. The hearth of the furnace is charged with alternate layers of wrought iron and plumbago, until it is sufficiently full, the relative thickness of the layers depending upon the amount of carbon which it is desired that the resulting steel should contain. If the iron were absolutely free from slag, and the plumbago were also absolutely pure carbon, then the proportions of the charge would be the same as the proportions of iron and carbon in the desired steel product; but as there is always more slag in muck bar (not, however, exceeding 1 per cent), and some silica in the plumbago, the proportions of which can be ascertained before the furnace is charged, the necessary allowance for these elements will have to be made, and the percentage of carbon can be regulated with great exactness, so as to produce steel, it is claimed, very nearly approaching to an ideal steel. The furnace being thus charged with muck bar and plumbago, the charge is melted in the usual way, and the operation further carried on as in the well known open-hearth process. Before the melted metal is withdrawn from the furnace, a small and definite amount of spiegeleisen or ferromanganese is added. By this process Mr. Wuth says he has made several charges of steel of 12 tons each, containing as low as one-hundredth of 1 per cent of phosphorus, and that he will be able to produce any kind of fine steel that may be desired.

Turning Chilled Iron.

The difficulty, says the *Mechanical World*, of turning rollers that have been chilled in casting, for the purpose of increasing their strength to resist the action of rolling, is owing to their extreme hardness, and in some cases the strongest tools will have but very little effect upon them, and even then they require a very slow speed with as slight a cut as possible. In turning, rolls not more than 14 inches in diameter—a speed that will not make more than one turn in four minutes, is often used. The cut is taken with a wide tool, without any feed motion, in the direction of the central line of motion. The cutting face of the tool lies in nearly the radial plane with the axis, and the amount of clearance is as small as possible, while a fine cut is taken by scraping, and weeks are required to finish what would be accomplished in as many days if the metal was not chilled in casting. The turning tool must be dressed from the very best of cast steel and left as hard as possible, held firmly in the tool-rest, and forced slowly to its work while the material is being removed slowly, but surely, till the proper size is reached, when it is set along on to take the next cut in this similar manner.

In working with hardened steel, such as cutting out circular cutters from saw-plates that have been hardened without disturbing their temper, clamp the saw-plate firmly to the face-plate of the lathe, and drive with as slow a speed as possible. If the back gears will not reduce the speed sufficiently, then manage to connect the lathe in some other manner for this purpose. The hardness of the tool must exceed the temper of the plate, or one will be as likely to be affected as the other. The particles at the extremities of the cutting edge must be as hard and more firmly supported than any of the material to be removed, and where there is but little difference between the resistance of the cut and the strength of the turning tool it is evident that the speed must be very low, as the resistance increases with the speed of the cutting and increases the strain brought upon the cutting edge of the tool. This amount is reduced to its minimum by reducing the depth of cut and the time in which it is to do the work, which reduces the operation of working metal of extreme hardness to that of scraping, as it were, while the work is barely perceptible in motion.

GRINDING BY MACHINERY.—For some time past a machine has been at work in Sheffield, which has effectually solved the problem, whether grinding can be done by machinery. It is the invention of James Mitchell. Not only can the machine do the work of five or six men, but the quality of grinding is said to be superior to that produced by hand labor. It is almost automatic in its action, and it does its work so easily and satisfactorily that a boy is sufficient to attend to it. The machine is altogether unlike what had been expected. There is no large revolving stone like those to be seen in grinding mills; but its place is taken by segments or blocks of stone, fixed by wedges and screws into the ribs of a hollow disk. These stone blocks are set with their faces toward the object or objects to be ground; and they are so fixed that they can readily be moved outward as the face begins to wear. When the machine is set in motion, the disk rapidly revolves at right angles to a bed or bedplate. To this bed plate the objects to be ground are secured. It has a backward and forward movement, and as it moves the articles secured to it are brought into contact with the stones on the face of the disk. The rapidity with which the machine does its work in comparison with the results of hand labor is very striking. But not only is it capable of grinding flat surfaces, and truing up edges; it grinds concave or convex, and bevels and angles equally well. It will thus be seen that the machine can be used upon a variety of objects.—*Scientific American.*

A New Manganese Steel.

A patent has been granted to J. F. Bennett, of Pittsburg, for an improvement in the manufacture of manganese pig iron, the object of which is to produce a pig iron having an excess of carbon by reason of the presence of manganese, and a minimum of silicon. The inventor claims that the result is a metal of such varying hardness as is desirable for stamp-heads, ore-crushers, &c. The precentage of the principal elements in the iron are: Manganese, 8.5 per cent; carbon, 4.45 per cent; silicon, .05 per cent. The first step in the progress of manufacture is to add manganiferous ores to the iron ores in the blast furnace to such an extent as to produce iron of the requisite percentage of manganese. The liquid measure is conveyed from the blast furnace into a reverberatory furnace, where it is kept until by the action of the hot gases passing on it silicon is removed; the metal is then run into pigs or else the entire charge of the reverberatory furnace is transported by means of a large ladle and trough to the casting mold. Concerning the amount of manganese ore necessary to add to the blast furnace charge, Mr. Bennett says that it would depend largely upon the quality of the iron ore and the mode of smelting, and would be governed by the following reactions.

If the iron ores contain as much as one per cent of phosphorus and are smelted with a comparatively cold blast of 800° F., part of the manganese would be taken up by the phosphorus and passed into the slag as phosphate of manganese; consequently it would require ore containing 11.5 per cent of metallic manganese to give 8.5 per cent in the finished product; again, if the same iron orea are smelted with a hot blast of 1,200° F., the same proportion of manganese would be taken up by the phosphorus, but a smaller proportion would go into the slag as silicate of manganese; therefore, ore containing 10.5 per cent of metallic manganese would give 8.5 per cent in the finished product; further, if the iron ores contain as little as one per cent of phorphorus and but little silicon, and are smelted with a blast of 1,200° F., it would require ore containing 9.5 per cent of metallic manganese to give 8.5 per cent thereof in the resulting pig iron; hence the most favorable conditions for reducing the percentage of metallic manganese required in the manganese ore to obtain a product containing a given per cent of the same are iron ore comparatively free from phosphorus and containing a minimum of silica, smelted at a low pressure of blast raised to the highest attainable temperature.

Mr. Bennett has been granted a second patent for a method of producing a manganese pig iron having a different composition from the above, the advantage claimed for it being that it has superior chilling qualities, and is therefore specially adapted for the manufacture of car-wheels. To attain this product the constituent elements should be present in the following proportion: Four per cent manganese, 4.15 carbon, .05 silicon, .375 phosphorus and other metals, and 91.425 iron.

HEAT OF COMBUSTION OF WOOD.—Mr. Ernest Gottlieb, says the *Revue Industrielle*, has made several analyses of different woods after drying them at a temperature of 115° C., and has compared the figures obtained with the amount of heat that would be developed in their combustion. The carbon and hydrogen were determined directly by combustion, by weighing the carbonic acid and vapor of water formed, the remainder, after deducting the ashes, giving the oxygen and nitrogen. The results were found to be in access of those deduced by applying the formula of Dulong. The wood containing 40.03 per cent of carbon and 6.06 per cent of hydrogen by combustion produced 4785 calories, which number, according to the formula, should have been only 4139.

A RULE for calculating the steam space of a boiler places it at twelve times the volume of steam required per stroke; another gives the volume of steam at something less than half the volume of water.

SCIENTIFIC PROGRESS.

Influence of the Earth's Rotation on the Flow of Rivers.

Mr. G. K. Gilbert contributes a new element to the discussion of "the sufficiency of terrestrial rotation for the deflection of streams," in a paper read to the National academy of science in April, and recently published in the *American Journal of Science*, which is presented by *Science*, as follows: Taking Ferrel's measure of the deflective force that comes from the earth's rotation, Mr. Gilbert shows, by a remarkably simple consideration, that its value is not so much in throwing the whole stream against its right bank, as in selecting the swiftor threads of the current, and carrying them against the bank; and, further, that this action will have especially well marked development in meandering streams, where it will aid the cutting on the meanders of right-hand convexity, and diminish it on those of left-hand convexity. For the Mississippi, the selective tendency thus determined toward the right bank is nearly nine per cent greater than toward the left; but it is not stated that the valley form has been noticeably affected by this preference. On Long Island, however, the form of the valleys is clearly controlled by the earth's turning, as was first suggested by Mr. Elias Lewis some years ago, and recently confirmed by Mr. J. C. Russell.

The article by Mr. Gilbert advances the question not only by properly applying the law to rivers flowing in any direction, but further by giving it a more delicate analysis than it has yet received, with the conclusion that in a certain favorable case the form of a valley may be decidedly influenced by this hidden control. While the result is of interest to physical geographers, the method of analysis has a wider importance. The application of mathematics to terrestrial physics has too often been fruitless from dealing with problems in a simplified or idealized form that departs too widely from the complications of natural conditions. This was notably the case with the supposed demonstration obtained by Hopkins in his geological speculations. It is therefore gratifying to find that increased value of Von Baer's law, now found by Gilbert, comes essentially from a close consideration of the actual rather than of the ideal conditions of river-flow. It is an advance in the application of mathematics as well as in the explanation of facts.

The lateral tendency of rivers was first noticed in the case of the Volga, which undercuts its right bank, as it should in this hemisphere. Other examples are found in North Carolina, in the channels of the streams flowing eastward to the coast, where the southern banks are the steeper; again on Long Island, and on the plains of New Zealand. But the radical valleys of south-western France afford better illustrations than any of these, inasmuch as their forms are accurately shown on the great map of the army engineers. North of the Pyrenees, about the towns of Tarbes and Auch, there is an old sandy delta deposit spread out by the rivers from the mountains while this region was still under water; and since its elevation, the streams formed upon it all follow its gentle slopes, diverging like the ribs of a fan from the higher center toward the lower margin, and cutting down their channels into the old delta plain. There is nothing here in the flat layers of unconsolidated sands to determine an unsymmetrical form in the valleys: and yet they all show most distinctly a gentle slope on the left, and a steeper slope on the right; longer lateral branches on the left, and shorter ones on the right; and many of the highways, constructed parallel to the streams on the as yet, unbroken uplands, are clearly closer to the streams on their left than on their right. All this is a direct effect of the earth's rotation.

It is customary, in speaking of the deflective force that arises from the earth's rotation, to say that it acts to the right in the northern hemisphere, but to the left in the southern. The reason for this is not found in a change in the direction of the force, but only in a change in our way of looking at it. It is as if one should look at the face of a watch in the northern hemisphere, and say that the hands turn to the right, and then, on going to the southern hemisphere, look at the back of the watch, and say that the hands turn to the left. Let us therefore suggest that the geographers of the southern hemisphere look at their winds and storms and streams from the upper side, just as they look at their watches; and, although this would involve them in the slight inconvenience of standing on their heads it would give them the moral satisfaction of seeing that the deflective forces of the earth's rotation, as well as the hands of their watches, always "make for the right."

THE SUN'S HEAT.—In a recent lecture on "Solar Physics," at the Royal Institution, C. William Siemens gives his reasons for setting the temperature of the photosphere of the sun at about 2,800° C., instead of about 10,000°, where Rosetti and other late investigators put it. He agrees, in this lower estimate, with Violle, St. Claire, Deville and Sir Wm. Thomson, and thinks the solar temperature cannot much, if at all, exceed that of the most powerful electric arcs. He recognizes fully the fact that a temperature higher than 3,000° C. would be absolutely conclusive against his theory that the solar heat is due to the recombination or burning of compound gases at the surface of the sun. He bases his estimate of the solar temperature upon three foundations: First, the behavior of a carbon rod and a small gas flame in the focus of a reflector exposed to the sun; second, on a comparison between the spectra of various lights—for instance, the Argaud burner, an incandescent lamp, the electric arc, and the sun itself, as observed by Langley on Mount Whitney; third, upon experiments on the relation between temperature and radiating power, made by means of a long platinum wire heated by an electric current.

HEAT DUE TO MAGNETIZATION.—Some 40 years ago, observes *Nature*, Dr. Joule raised the question whether a body that is magnetized undergoes any change in its temperature; but the question has not yet received a definite solution, the rise of temperature which accompanies magnetization being ascribed by some to induction currents, and not directly to magnetism. While recognizing the influence of the former, Mr. Borgman has tried to show that there is also a change of temperature due to magnetization and demagnetization, and that the amount of heat thus disengaged is proportionate to the squares of the temporary magnetism. M. Bachmetieff, having made at the University of Zurich an extensive series of experiments, arrived at the conclusion that magnetism, by itself produces variations of temperature in magnetized bodies, and that this "magnetic heat" is equal to the product of the magnetic moment by the magnetizing force multiplied by a constant; it increases, also within a certain limit, with the frequency of the interruptions of the magnetizing current, and increases still more when the direction of the current is alternately changed. Its amount is not equal throughout the length of an iron cylinder, reaching its maximum about its middle and decreasing toward its ends. Its cause must be searched for, in purely mechanical forces, and it depends upon the speed of rotation of the molecular magnets.

PREPARATIONS OF ALUMINUM. According to an account in *Chemiker Zeitung*, ferro-silicium is mixed with fluoride of aluminum in equal proportions, and the mixture is exposed to a fusing heat. The materials decompose each other; and volatile fluosilicium are produced, the latter two bodies being alloyed together. In order to extract the valuable aluminum, a copper alloy is formed by melting the iron alloy with metallic copper; by reason of a greater affinity of the copper for aluminum this is secured, leaving with the iron only a slight residue of aluminum. When the fused mass is cold, copper, bronze and iron have so settled that both bodies can be easily separated. In place of the pure fluoride of aluminum, chloride can be used, when chlorsilicium and iron aluminum alloy are formed. If in practice the chemical reactions above outlined are found to hold true, this patented process promises to be of considerable value.

DECAPITATED INSECTS.—S. R. Canestrini has been experimenting upon the defects of decapitation upon insects. Butterflies were able to use their wings eighteen days after they had lost their heads. Crickets leaped on the thirteenth day after they had been beheaded, and the praying-mantis showed signs of life in fourteen days after the head had been separated from the body. He gives still more singular observations, to show that the head in insects cannot be subject to the same perpetual strain as the head in mammals in guiding the motions of the body.

BY MICROSCOPIC EXAMINATION of the cross-section of a single human hair, Prof. E. B. Taylor states, the race of the individual to whom it belongs can be determined. Pruner's method shows whether it is circular, oval or reniform. Mosely has explained how the follicule curvature may be estimated by the average diameter of the curls. Sorby's plan gives the coloring matter. Dr. Muller, of the Novara expedition, has published a classification of man, primarily arranged according to the hair, with a secondary division according to language.

SOLAR HEAT.—Hirn, the French astronomer and physicist, has devised an apparatus for determining the actual calorific power of the solar rays. An alembic of copper containing sulphuric ether is exposed to the sunshine. The heat absorbed volatilizes the liquid, which is condensed in the alembic. Regnault's formula is employed to calculate the solar heat absorbed from the quantity of liquor condensed.

BLUE AND RED RAYS.—As to the rays of the solar spectrum, Prof. G. Forbes still maintains that the blue rays travel faster than the red, the assertion of M. Cornu to the contrary notwithstanding. It may be remembered that M. Cornu thought that Prof. Forbes was misled by the nature of his apparatus.

MAGNETISM.—Prof. Hughes explains the phenomena of magnetism by a simple rotation of the particles of iron. He gives a full exposition of his theory in a paper read before the Royal Society, London.

MAN AND BIRD.—It has been figured out by Dr. Wood, the eminent student of nature, that if a man could eat as much in proportion as a bird he would consume a whole round of beef for his dinner.

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Passing Events.

There is some little excitement about the New River mines, which are about 85 miles from Eureka, Humboldt Co., in this State. The quartz is gold-bearing, and there are hopes that the new camp will be a permanent and prosperous one.

There are two "booms" going on in Colorado just now, one near Breckenridge, caused by the discovery of large and reputedly very rich placer fields, and the other in the Tomichi district, Gunnison county.

Three fires in as many mining districts within the past few weeks have given "set-backs to each of the localites, but where the mines are at all prosperous, the camps will be rebuilt in better shape.

The opening of the Mechanics' Fair in this city occurred on Tuesday, an account of which is given in another column. The exhibition this year, when all arranged, is expected to be much superior to former ones, and will show our industrial advancement in very many branches.

The strike in the Quijotoa mines, Arizona, reassures many persons concerning the future of that important camp.

PERSONAL.—We received an invitation to attend the wedding of Prof. John A. Church and Miss Jessie Angeline, daughter of Mr. Bryant M. Peel, at Los Angeles, July 30th, and are pleased to extend congratulations to the happy couple. Prof. Church is evidently now settled on this coast.

Water Rights in California.

The system of water rights built up by the early decisions of the courts in this State was not based on either the common or the civil law rules regulating the rights of riparian owners or the use of water in running streams, but was, as Chief Justice Murray said in one of his decisions, "based upon the wants of the community and the peculiar condition of things in this State, for which there is no precedent, rather than any absolute law governing such cases." This remark was repeated in other cases, and the fact is admitted by Mr. Justice Heydenfeldt, who first made the wide departure from the common law, in the absence of legislation, in the principal case of Irwin *vs.* Phillips; and also by Mr. Justice Burnett, who apologized for the error, and then justified it in a certain decision in which he says "that, being left without precedent or specific legislation, the courts were compelled to apply the analogies of the common law and the *more expanded principles* of equitable justice."

In the same opinion of the Chief Justice (in the case of the Bear River Co. *vs.* York M. Co.) he remarks: "The absence of legislation on the subject has devolved on the courts the necessity of *framing* rules for the protection of this great interest; and in determining these questions we have conformed as nearly as possible to the common law. In a case, however, which occurred in 1865, where there was a controversy about a water right, Mr. Justice Sanderson combated the idea, which he said prevailed, that the rules of common law touching water rights have been materially modified in this State upon the theory that they were inapplicable to the conditions existing here. He says "the notion is without substantial foundation. The reasons which constitute the common law remain undisturbed. The conditions to which we are called upon to apply them are changed, not the rules themselves." Judge Heydenfeldt said substantially the same thing in one of his early decisions.

Another justice decided, however, that the law as applied in water cases, that a riparian proprietor is entitled to have the stream flow in its accustomed bed, without diminution or alteration, is not applicable to miners or ditch owners, because the conditions upon which its rule is founded do not exist in their cases, as they seek water for another purpose—that is, diverting it from its channels for mining or irrigating. But the ground of the misapplication of the common law principles with earlier cases, says Gregory Yale, matured into the settled law of the State is, in the very example given as an exception to the rule, namely, its diversion of the water in running streams from their beds, in violence of the rights of riparian owners.

In the principal case of Irwin *vs.* Phillips the broad doctrine was announced for the first time in any system of jurisprudence, that the right of the unlimited use of water in a running stream vested in the first appropriator, whether a riparian owner or not with the correlative right to divert it to any extent, for sale or other use, and that subsequent locators even for mining purposes, upon the banks of the same stream, as riparian owners, could only acquire an interest in the water for any purpose subordinate to the rights of the first appropriator, provided any water was left.

This is the principle at the foundation of the hydro-mining rights in this State, and applies to all other cases of the appropriation of water for any legitimate purpose, subject to the rules originating in the same manner, modifying the general doctrine.

In a case involving a question of water rights, decided by the Supreme Court last week, the following points were made:

A lawful appropriator of water is entitled to an injunction against a trespasser.

Each and every tenant in common has the right to enter upon and occupy the whole of the common property and every part thereof, and may recover the whole from a trespasser.

The circumstance that the time or times when the plaintiff is entitled to use the waters in question, has not, as between him and his co-appropriators, been fixed in any way, does not concern defendant, who is a mere trespasser.

Co-tenants being entitled to use *all* the waters, when an outsider diverts any from them, or any one of them, he is injuring all and each of them.

A Mexican Mining Code.

The Mexican code of mining laws is the oldest on the continent, and when settlers on this coast began to mine, many of the Mexican customs were adopted. In fact, the United States had no laws on mining, until after the discovery of gold in California. The Mexicans who were here were the only persons with experience in this direction. General H. W. Halleck, long a resident of this coast, wrote a work in 1859, on the mining laws of Spain and Mexico. The study of this code was a matter of special interest in California, because the territory had previously been governed by Spanish and Mexican laws. In 1848, ten days after the treaty with Mexico was signed by the commissioners, but then unknown to the military officers of California, and shortly after the discovery of gold, Col. Mason, as Governor, issued a remarkable proclamation concerning the mines, operating directly, as he supposed, upon mining titles; and, by a wondrous forsight, while committing a blunder in fact, settled the laws as the Supreme Court held fourteen years afterwards, in Castellero's case: "From and after this date, the Mexican laws and customs, now prevailing in California, relative to the denouncement of mines, are hereby abolished. The legality of the denouncements which have taken place, and the possession obtained under their seventh occupation of the country by the United States force, are questions which will be disposed of by the American Government, after a definite treaty of peace has been established between these two countries."

Under President Tyler's administration the topic of mining was first presented by the Executive to Congress. He thought the establishment of a mint would afford facilities to miners and to the Government in disposing of mineral lands. He also recommended a geological survey and that the mineral lands should be divided into small lots valuable for mining. Our interest in Mexican laws thus ended, though many Mexican mining terms and customs were drafted into our mining literature and industry.

It seems now that the Mexicans find their mining code, so long in existence, is faulty, and they are about to remedy it. They will doubtless graft into their proposed code many features which experience has proved correct in this country. General Pacheco, the Minister of Public Works of Mexico, wishing to collect full mining statistics, and to utilize the knowledge of miners for the publication of a new mining code, recently called on all the Governors of the different States to revise the two projects to that end submitted to them. The following Governors and engineers will do so: Aguas Calientes, Mining Engineer Miguel Velasquez de Leon; Colima, Justinio Solorzano; Chiapas, Manuel Carrascosa; Durango, Carlos Bravo; Guanajuato, Miguel Rul; Guerrero, Alberto Garcia Gronados; Hidalgo, Gabriel Mancera; Jalisco and Mexico, Mariano Barcena; Michoacan, Manuel Urquiza; Morelos, Leonardo Fortuno; Nuevo Leon, Emerterio de la Garza; Oaxaca, Licentiate Manuel Dublin; Puebla, Antonio del Castill and Nicolas Islas Bustamente; Queretaro, Lic, Jose Sinares; Linaloa, Ignacio L. Vallarta; Sonora, Jose Patricio Nicoli; Tabasco, Lic, Joaquin Arcalde; Tamaulipas, Francisco B. Leal and Enrique Montamar; and Tlaxcala, Joaquin Salazar and Thomas Murphy.

When a Relocation is a Trespass.

Miners making relocations of mining ground should be careful to find out that the said ground is legally abandoned and open to relocation by failure to do assessment work, etc., before they take the trouble to claim it. The Supreme Court of Colorado has just re-affirmed its former decision that actual possession is prima facie evidence of title, and that entering upon premises in the actual possession of another for the purpose of performing the acts necessary to constitute location and possession, amounts to a trespass, and cannot form the basis for the acquisition of title. Whether the location of the party in possession be valid or not, their possession is sufficient to defeat a recovery by the party entering to make a new location. In this decision, the principle of "possession being nine points of the law" is maintained, and miners should bear this in mind when desiring to make relocations.

The same court also decides that mine owners are not responsible for recorders' mistakes. A prior location of a mining claim is not invalidated by a mistake of a recorder in recording such location by a name somewhat different from that stated in the certificate of location.

A Reversible Steam Gang-Plow.

There is in process of construction at the Union Iron Works, in this city, the engine and machinery for a steam-plowing plant, on an improved system, the invention of Mr. Wm. H. Foye, who has just received his patents through the MINING AND SCIENTIFIC PRESS Patent Agency. The machinery is being made for the Pacific Steam Agricultural Manufacturing Co., of this city, an organization with the following officers: Irving M. Scott, President; Josiah Stanford, Vice-President; Moses Hopkins, Treasurer; C. W. Brooks, Secretary; and Wm. H. Foye, Superintendent. The other Directors are ex-Governor Geo. C. Perkins, Hon. John F. Miller and Ariel Lathrop. Mr. Foye has several patents on steam-plowing machinery, but the plow just patented is far superior to any other, and has a number of advantages over the Fowler system, being simpler, lighter, smaller and much more easily moved and managed.

The Fowler plowing plant costs, laid down here, $40,000. This apparatus, with two plows, harvesting and thrashing machinery, etc., will cost about one-sixth of the other system. The machinery is so arranged that when the plowing and sowing is done, and harvest time comes, the same engines used for plowing can be used for cutting and thrashing the grain.

The plow is of that class of gang-plows which are hauled across the field to be plowed by means of engines placed at one side or both sides of the field, or by other suitable means; and its object is to provide a plow to be operated by steam and wire cable that will plow forward and back upon the same landside without turning around. It consists of a series of right and left-hand plows, secured at the proper angle on opposite sides of the plow-beam, with the points standing in the opposite direction to the line of travel. The beam may be provided with any number of plows cutting different widths of furrow, or any other tools used in working the soil. The plow beam is square at the ends, and provided with a bearing at equal distance from each end, which holds it firmly in a position to swivel around in the arc of a circle, and when at a point parallel with the side frame, it revolves or capsizes, bringing the right-hand plows that have completed their cut to the top of the beam, exchanging places with the left ones, so that the plow may start on the return cut upon the same landside without turning around.

The frame in which the plow beam is mounted is provided with slots at each of the four corners, through which the end of the plow beam works, and is depressed to give the required depth of cut, and elevated for the purpose of changing the position of the plows from right to left-handed work. Means are provided by which the beam is raised in the slots at each corner of the frame; and there are channel-ways, in which the ends of the plow beams travel from a right to left-hand corner. There are also castor-wheels which support and carry the plow and steering-gear by which it is guided across the field, as well as means by which the beam is supported at the bearing in the center of the frame.

This beam plow is only 14 feet long, whereas the English plows to do the same work are 36 feet, and are proportionately heavier. The details of construction are very much simplified. The machinery will be completed in a few days, and thorough trials are to be made in a practical way.

Academy of Sciences.

President Davidson, who returned from the East last week, occupied the chair at the meeting of the Academy of Sciences on Monday evening.

The President reported having received a letter from Lieut. Doty, commanding United States Revenue Marine steamer *Corwin*, reporting that on their way to Kotsebue sound they stopped at Oonalaska, in latitude 54 degrees north, and after leaving there, May 20th, they spent the following day examining Bogosloff island, in Behring's Sea, north of Oonimak. Photographs and drawings of the new island were exhibited.

Prof. Davidson then spoke of his recent visit to the Grand Canyon of the Colorado at a point 160 miles east of the Needles, on the Atlantic and Pacific Railroad, which required only 21½ hours' time, and an expense of $10 for horses and guide and 75 cents a meal. He saw vertical walls 2,700 feet high, 6,200 feet above sea-level, where the Colorado river was 190 feet deep, and cannot imagine anything grander than the effect of sunset shining on these walls only 10° from vertical, composed of different colored rocks, red sandstone and the black overhanging rocks. The temperature was 136 Fahrenheit.

Capt. William Lund, of the Hawaiian brig *Dora*, presented a collection of water snakes found 10 miles at sea; also a live *Iguana*, 12 feet long, or species of boa-constrictor, found by him on Tres Marias Island.

Mechanics' Institute Fair.

The annual exhibition of the Mechanics' Institute was formally opened on Tuesday last. The exercises took place at the Grand Opera House. Mr. P. B. Cornwall, President of the Institute, in the course of his remarks gave a brief review of the history of the Institute. He said that just twenty years ago, after nine years labor they were ahead only $11,588. He said:

It would weary you to listen to the statistics which show the labors and gains during the past twenty years, but the visible and material results are evidenced by the substantial three-story brick library building on Post street, in which is a library of over 35,000 books, selected with great care, and to which large additions are made each month of new and valuable publications; and by the entire block of land bounded by Hayes, Larkin, Polk and Grove streets, with its vast exhibition building fitted with powerful engines for driving all kinds of machinery.

It is safe to estimate in dollars and cents the net value of the property of the Mechanics' Institute to-day, at half a million dollars, and to say that with careful management it is likely to become within the next twenty years one of the most wealthy and useful institutions of its class in any country. It is contemplated to build when the proper time comes, a spacious and convenient library building on the corner of Larkin and Hayes streets, with large rooms fitted for lectures, technical classes and other purposes.

The Institute owes the larger part of its material prosperity to its Industrial Exhibitions, and something to the faithful and gratuitous services of its founders and their successors in the management of its affairs. Besides its financial solidity, it has a sure foundation in the hearts of its members, and, I hope, and believe, has the sympathy and good wishes of the people of this city, who have witnessed its early struggles and are glad of its success.

The oration was delivered by Mr. Frank M. Pixley. It is a scholarly production, but space forbids making more than a few extracts. His remarks on the work of the mechanic were specially forcible:

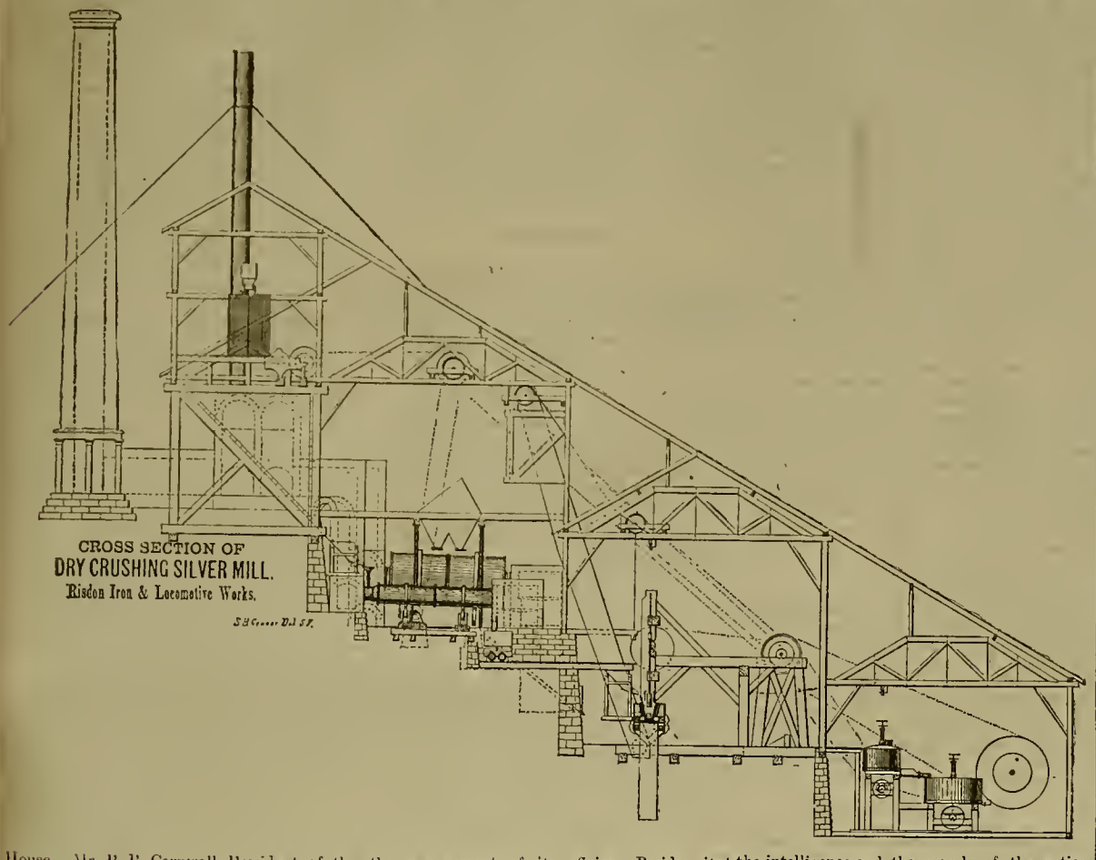
The work of the mechanic is seen in grander results than in the product of his mechanical skill in the manipulation of material things. It is observed in the social life that surrounds us, in the fabric of law, order and Government, without the protection of which there is neither safety, progress nor comfort in existence.

California is a State and this Pacific coast an Empire of magnificent destiny, and in that future you gentlemen of skilled trades are to enact a responsible part. You, with the other workers, compose the great middle class of society upon whom devolves most of the duties and responsibilities of upholding the Government and maintaining the law. You are so placed in the organization of society that in your own interests, and in your own defense, you must shield the community from the follies of aggressive, indolent wealth, from the actions and greed of corporate power and all the evils necessarily incident to wealth and power.

The middle class is that in which the wealth, the intelligence and the morals of the nation are found. It is the great voting majority of the country, and upon its political course hangs the destiny of the Republic. The sum total of millionaires is small when compared with the accumulated wealth of the great industrial class. The intelligence of the schools, the culture and learning of the educated few, is not to be measured for practical usefulness with the common sense intelligence of the great middle class. The place to look for any virtue is not among those who inherit wealth, or the class that indulges itself in criminal idleness.

It is the mechanical man more than any other of the business or laboring class that thinks. The mechanic is compelled to think as he labors, necessarily, and naturally he considers whether by some ingenious mechanical device or some skillful appliance he may not render his labors less severe or more satisfactory in results, whether he may not attain better ends in lesser time by some labor-saving invention. He is the father of a family, the owner of a home; he is a citizen called from his duties to perform the duties which society demands; he must serve on juries, pay taxes, serve as *posse comitatus* in war; he must serve his country; he is an elector; he has lives to guard, property to protect and rights to defend, and as he toils he thinks. He can work with his hands and think. There are very few who think—they are many who think they think—and when from the pulpit, the rostrum or the press, there is suggested some pregnant thought, the mechanic that has the brains has the time to think it out to a rational conclusion.

I say the mechanic that has brains, for, unless the man has brains, he is not a mechanic, he is a worker and imitator, but he is not a mechanic. Professional men consider specialties. The merchant as a class, thinks but little, the farmer, as a class, thinks less, the laborer who works only with his muscle not at all. There are splendid exceptions to the rule as we have generalized it, of great active-minded, noble men in all the classes named, and from these then arise those superior minds that compose a class that rules the world, a class embracing the great thinkers, philosophers, scientists, statesmen and heroes, the great inventive geniuses of the world, the great guiding, directing minds, who in all past ages have, and in all future time will, control the destiny of mankind.



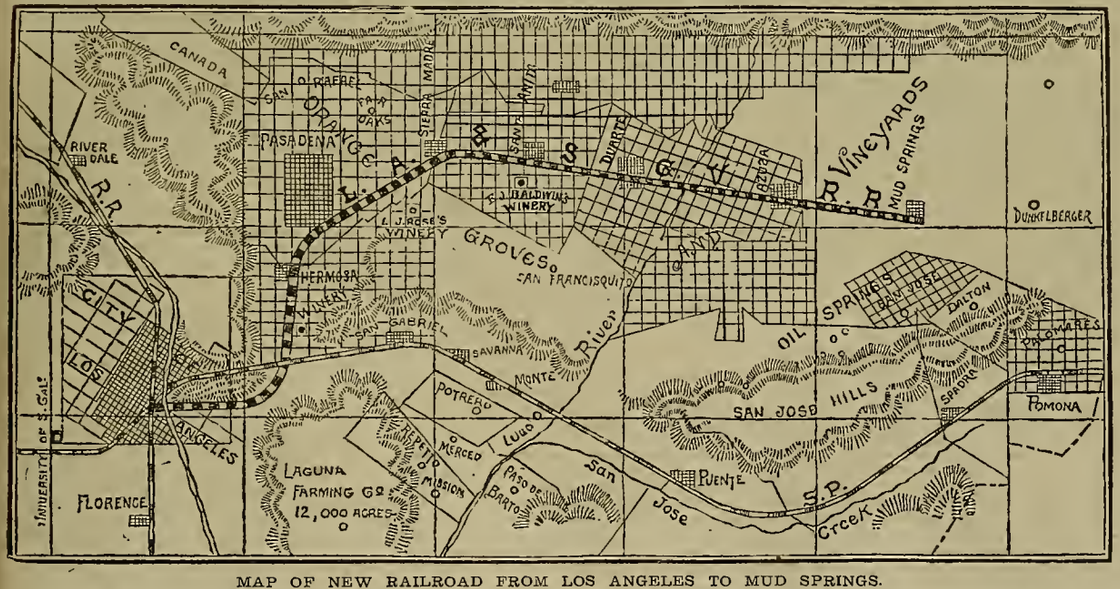
Hoisting Ropes.

A noted writer on mining topics, who has been visiting the Continent and noting such things as would interest mining engineers, states that notwithstanding the frequent breaking of aloe fibre drawing ropes, the Belgian miner clings to the opinion that they are superior, from the point of view of safety, to wire ropes. And in France, where such accidents are relatively rare, it would be hard to shake the confidence of the collier in this vegetable material. In both countries there is a distrust of wire ropes not easily to be accounted for except by attributing it to the influence of habits and custom. It is contended, in justification of the opinion, that the metal of wire ropes undergoes rapid change when subjected to the vibrations of violent shocks to which a drawing rope is continually exposed, and that it is very hard to perceive by mere inspection the existence of conditions that lead to rupture. The weakening of a fiber rope is said to be a gradual process, and by measuring the extent of stretch and the consequent diminution of the diameter, the true stage reached in that process may be easily and accurately ascertained. But these indications are not found in wire ropes. It is strange that this distrust of the wire rope has not been removed, or at least diminished, by the experience obtained in England and in Germany, where it is in general use. But the fact remains that in only a few instances has the fiber rope been discarded, and in these cases it has been done with much misgiving. Mention the wire ropes to the French miner and you are answered by a determined shake of the head.

In Germany it is a common practice to interpose springs between the drawing rope and the cage. A mining engineer of much experience in that country states that this practice, which is fast becoming general, adds very considerably to the life of a rope by relieving it of the shocks of starting, and that as a security against accidents from breakage of the rope these springs have been found to be of great value, inasmuch as they notably lessen the destructive effects of abnormal shocks.

A New Railroad Project.

We give herewith a map of a new broad guage railroad projected from Los Angeles to Pasadena, and then along the northeastern boundary of the San Gabriel valley, over the high mesa land at the foot of the mountain, passing through the vineyards of Gov. Stoneman, and Mr. Rose, touching at the Sierra Madre Villa, passing just to the north of Baldwin's winery, and thence northwesterly and easterly to Mud Springs. Here a halt will probably be made for a short time, until that part of the road is placed in good working order, and business upon it well established. It will then probably be continued onward along the northern edge of the valley to San Bernardino, which is the ultimate proposed terminus.



MAP OF NEW RAILROAD FROM LOS ANGELES TO MUD SPRINGS.

The line has been run and the center stakes driven and a profile prepared as far as Mud Springs, and negotiations are now in progress to put the work of grading and track-laying, if indeed they have not already been completed, under immediate contract. If the present proposed arrangements are carried out, as we presume they will be, the track will be laid and the road ready for operation to Mud Springs early the coming winter. Careful estimates of the business that would naturally come to such a road, show that it would in all probability be a paying investment from the start. Such a road is much needed, and will greatly assist in developing and building up the localities through which it will pass. It will form a most convenient means of access to Pasadena and the Sierra Madre Villa, both of which places are rapidly growing into importance as places of resort for invalids, where all such can visit or remain with equal benefit, summer or winter. A large hotel, calculated to accommodate several hundred guests, is already projected at Pasadena, and it is expected will soon be constructed, which will be fully equal, if not superior, to the Hotel del Monte, at Monterey.

The Lost River Region.

There are many prospectors in the Lost River country, where three towns bave already been laid out—Alder City, Houston and Carbonate. The Wood River *Times* says Alder City is beautifully situated on an undulating plain, and susceptible of cheap irrigation. The site is owned by W. T. Riley, Texas Angel, Moses Biddy and Mr. Eggert, of Hailey.

Houston is two and a half miles above Carbouate, and the site belongs to the Bruner Brothers, Frank Brown, Mr. Williams and M. H. Vanlandingham.

Carbonate is two and a half miles farther, and nearer many of the mines than either of the other towns. The site is owned by W. G. Seamands, J. H. McAllister, and others.

There are many good mines within a few miles of the town above mentioned. The enormous copper vein of the Bruners, Williams, Brown, etc., is already attracting the attention of capital every where, and will undouhtedly sell up in the millious some time.

H. Curtis, C. Ross, W. Yates and Jesse Stinsou are opening up some very fine prospects.

Messrs. Peterson, Tarbitt and Canady have the Mammotb and Copenhagen claims, up Alder gulch. On the first named a 75-foot shaft shows a 6-foot veiu of galena and carbonates; the second has a tunnel 100 feet long, showing 4 feet of ore, averaging 90 ounces.

G. W. Rose and Mr. Harrison own the John L. Sullivan—a 3½-foot vein of galena and carbonates, with a 10-foot shaft. They also own the Found-at-Last and Nature, the former a 4-foot and the latter a 3½-foot vein.

Jack Woodruff's 30-foot shaft on the Alice shows 3 feet of ore, and the Mayflower, 10-foot shaft, 4 feet of ore.

Owen & Hall own the Isabella, shaft 30 feet deep, showing good ore. Vein carries 15 feet of solid ore. This is also a mammoth mine.

Near the head of Alder gulch the Grand Prize, owned hy Jones & Herndon, is located. The vein is 30 feet wide. and shows 18 feet of ore. There are all of 400 tons of ore on the dump, and the property is bonded to E. Egan, of Salt Lake, for 30 days from last Monday, for $40,000.

Jonas & Herndon also own the Hidden Treasure, 10 feet wide, with 5 feet of ore.

Stoner & Reeser owu the Hill Top and Gray Eagle—a very fine prospect.

A short distance above Alder creek, on Lost River, W. H. Burnett owns the Denver & Rio Grande and other claims. These show a large body of carbonate.

Above Carbonate City, Dow & Platt own the Pilot, which shows a 60-foot veiu, of which 4 feet is high-grade ore.

James Viar & Co.'s Black Daisy has a 60-foot shaft, tunnel and open cuts; the vein is 2 to 20 feet in width, with 500 tons of high-grade ore on the dump.

Highly Phosphuretted Pig Irons.

The following note by Prof. N. W. Lord, of Columbus, Ohio, was read before tbe American Institute of Mining Engineers:

There bave been made at one or two places in Ohio, during the last year or two, some irons of rather unusual phosphorus percentages.

The first of these which I had occasion to examine came from Moxahala furnace, in Perry county. The furnace was built originally to smelt an ore found in large deposits near its furnace in the "black band" horizon. The deposit was easily exposed by simple "stripping;" it was from six to eight feet thick, being a blue carbonate ore very free from silica. This ore yielded, on analysis, from two to three per cent of phosphorus when carefully sampled.

The furnace company had trusted entirely to old analysis made on "out-crop" ore, well weathered, and received all other results with differences. The result of the first run of the furnace was an iron in large whitish-gray crystals, and so brittle that it could be pulverized in a mortar. This iron contained 4.90 per cent phosphorus. A limited quantity only was made, which was gradually disposed of as a great "softener" to foundries. The Moxahala furnace was subsequently run on Lake Superior ore mainly.

The second case of such iron occurred last summer at Mt. Vernon furnace. A deposit of what was locally known as "Hallelujah" ore was opened for the furnace. This ore was a blue carbonate similar to the first described.

The iron made was pure tin-white in color, and showed large crystals without a trace of the grain of ordinary pig iron. It was supposed at the furnace to be spiegeleisen, and was sent to me to be examined for manganese, of which, however, it only contains a small amount. It, however, contains phosphorus 4.30 per cent; silicon, .05 per cent.

It is remarkable in its very low silicon percentage. This element was determined by Dr. Drown's nitric and sulphuric acid methods.

The iron contains no graphitic carbon, but dissolves completely in nitric acid to a brown solution. The carbon was not determined, owing to pressure of other work.

The above facts show that when basic steel manufacturers want an iron with little silicon and four to five per cent of phosphorus we can furnish it *ad libitum*.

Asiatic Cholera.

There is perhaps no term in the English language packed with more horror and dread than the word cholera. Its approach is so silent and mysterious, its ravages so widespread, and its attacks so formidable to the ablest medical science, that it well deserves to be called the crowning terror of the world. As nearly a generation has grown up since its last visit to this country, many of our readers may be practically ignorant of this terrible disease.

There are three well defined species of the disease; cholera morbus, cholera infantum and the Asiatic or epidemic cbolera. It is the last form that raged last year in Egypt, is now raging with fatal results in Southern France and threatens Europe and America. It is well named the Asiatic cholera, as its breeding places are known to be the marshy lands of India, where it is formed and bred hy the filth, squalor and wretched food of a crowded population. It has been known for centuries, and in 1817 it left its nsual home and set out on a pilgrimage of death that twenty years of horror and the boundaries of the globe alone could check. In 1826 cholera destroyed 150,000 persons in the city of Bombay alone. The inhabitants of Madagascar, the eastern coast of Africa, and the islands of the sea, next fell victims to the pestilence, and one year later it had advanced into Arabia, Persia and Asia Minor. In 1829 Southern Russia and Moscow, were overtaken, and three years after it had found its way into the heart of Great Britain. The first appearance of cholera on this continent was in Quebec, in June, 1832, and two years later the yellow flag of death was flying in Montreal. The fearful pestilence broke out in New York, June 21st, and raged with violence for three months.

In spite of the strictest quarantine along the rivers, canals and ways of travel, it soon spread to all the cities and large towns of the Union, digging grave-yards in a day. In 1834 there was a renewal of the epidemic, but in a modified form, and it gradnally disappeared. In 1849 it again reached our shores and raged with more or less intermission up to 1853, sweeping away thousands, or more truly, hundreds of thousands of victims. It has since appeared in this country, but not to an alarming extent, and for nearly twenty years has not been here at all.

Dr. Koch, the eminent German physician, by patient experiment, has succeeded in tracing the cause of this terrible disease to an infinitely small parasite. He was led to this discovery by verifying the fact that a large number of the most fatal diseases are owing to the same cause. These iuclude typhus and typhoid fever, small pox, diphtheria, scarlet fever, yellow fever, and even consumption—all of which are propagated hy living organisms. These microorganisms are about the one-thousandth part of an inch in size, and most of them, under the microscope, look like fine rods of various lengths and sizes. They can he isolated and cultivated on a soil made of gelatine and the watery portion of the blood. There each variety may be developed into its own peculiar shape and form, Some form little mounds, some adhere together like the blood corpuseles, and others assume the most strange and grotesque shapes. One, supposed to cause typhoid fever, is called bacillus; those found in the decaying tissues of the lungs, in consumption, are the micrococci.

Dr. Koch, following up this discovery, applied it to the study of cholera for a long time without success; but at last succeeded in demonstrating that this disease is governed hy the same law, and the cholera bacillus is now an established fact. And what seems remarkable, this bacillus is not found in the blood of persons suffering from the cholera, nor in that of those who succumb to the disease, but is only found in the intestinal canal, where they accumulate in astonishing numbers.

This discovery explains the cause of the numerous rice-water discharges that so long seemed incomprehensible, and why the use of disinfectants first proposed and tried in London produced such good results; they destroyed all low organisms and especially hacteria. It is found, however, that some disinfectants are better than others, the effect probably depending upon the kind of bacteria they are called upon to kill. For instance, quinine acts as a disinfectant mainly on the bacteria of decomposition. From a great number of observations made during the last great cholera epidemic in London, the physicians came generally to the conclusion that sulphuric acid and the tincture of the chloride of iron were specially destructive to the cholera bacillus.

But the greatest preventive to the origin and spread of cholera is, undeniably, cleanliness. In Oriental countries it is eminently a disease of filth, and its ravages have always been greatest where squalor, wretchedness, had food and dirt abounded. It, therefore, clearly becomes the imperative duties of the authorities of our cities and large towns to prepare for the visit of this dread epidemic. It is the hight of folly to assume that cholera can he kept out by quarantine and instructions from the State Department. We should he prepared to meet it with the most effective preventives, for in this disease, as in all others, an ounce of prevention is worth a pound of cure. Among the many suggestions that have been made, none are more sensible than those of Sir Robert Rawlinson in a recent number of the *Pall-Mall Gazette*. Mr. Rawlinson has passed through several seasons of cholera, was in the Crimea when the disease raged so fatally there, and his opinions may he regarded as those of an expert. The prime element of the cholora, he says, is human life, "massed on swampy or low, undrained sites, having been long occupied, unceasingly fouled and deusely crowded." And he adds: "But drain these sites, remove foul privies and cesspools, regulate the tenements, and at short intervals cleanse, ventilate and limewash the slums, and cholera, if introduced, will not spread." But he places more reliance upon systematic and thorough scavenging. After finshing the main sewers, providing plenty of pure water in the house, perfect closet accommodation and drains to remove waste water and impurities, the scaveuger must thoroughly do his work. "All that water can remove must he washed away; all matter liahle to become putrid must be consumed hy fire."

Local Glass Works.

The San Francisco and Pacific Glass works on King street near Fourth have heen almost entirely rehuilt within the past few months so as to adapt them to the manufacture of fine goods of flint glass. They propose to make table ware, har goods, jelly glasses, retorts, chemical ware, all kinds of pressed goods, druggists shop ware, lamps, lamp chimneys, etc. They propose also to do grinding and make stoppered ware, such as tincture bottles, etc. The factory will he fully equipped. They will make colored glass also, such as ruhy, blue, turquois, etc. They have in eight crucible furnaces with a capacity of four tons of glass per day. Some 75 hands will be employed in the flint glass works; though part of the old works will still be kept on rougher qualities of glass as at present—hottles, demijohns, etc.

Hands for these new works have been brought from the East—hlowers, pressmen, cutters, engravers, etc. They expect also to make fish globes, candy jars, etc. Only white labor will be employed at this work.

They have 200 men at work in tbe factory now making fruit jars, jugs, bottles, castings, etc.

The works can procure no suitable sand on this coast, so have to import it from Belgium. They have 1,000 tons of sand ou hand and 400 tons more on the way. Tbe soda and chemicals come from Europe also.

This enlargement of the glass factory and its new features will make it a very complete establishment and one of much use to the people on this coast. It will stop much of the large importation of glass now going on.

CALIFORNIA BUILDING STONE.—It was originally iutended by Mr. J. C. Flood to build his mansion iu this city out of stone quarried in this State. Samples of stones from all parts of the State were submitted and over 50 of them were tested. A number were found to answer all requirements, among them heing varieties of granite, marhle, sandstone, brownstone and the so-called blacklog stone. But when matters were reduced to a husiness basis it was found that the cost of getting this stone to San Francisco in the desired shape would he so high that three times the required amount could he brought from the East for the same sum of money. For instance, it would cost as much to break out California marble and ship it to this city over the railroad as it costs to hring marble from Italy, leaving out of consideration the fact that the latter can be worked much more easily. It was the same with Penryn granite, although this variety of stone was undesirable for other and personal reasons also. Of brownstone there were two excellent samples. One came from an island lying south of San Diego, off the coast of Lower California, and the other from Solano county. In both cases the quarries required to be opened, their owners expecting that J. C. Flood should furuish the money, although they were not willing to give him an interest in the property. The negotiations with the owners of the blacklog mine resulted unsatisfactory for the same reason, although a company was incorporated to quarry the stone, which is of a hluish-gray color and is found just north of the California line iu Oregon. But in this case the building of 10 miles of railroad and a breakwater were found to be necessary, both operations of far greater magnitude than the huildiug of the house itself. It was for these reasons that it was finally decided to go East for building material. The negotiations, however, have at least shown that California possesses abundant and choice building material and that it requires only a little enterprise and capital to make use of these resources.

THE Los Angeles Board of Trade, iu a late memorial to Congress, gives some interesting county statistics. In this document the number of acres of vineyard is given at 20,000, which produced 4,000,000 gallons of wine and 250,000 gallons of hrandy in 1883. There are iu the county 526,000 fruit trees in bearing. The cereal products are given at 2,000,000 hushels of wheat 1,500,000 hushels of corn, and 1,000,000 bushels of harley. The petroleum district, extending into Ventura county, includes 200,000 acres of land, from which there was pumped, in 1883, $1,000,000 worth of coal oil. In the district made up of Los Angeles, San Diego and San Bernardino counties there are 9 breweries, 10 cigar factories, and 46 grape brandy distilleries. The mineral products include gold, silver, lead, iron, copper, tin, lime, granite, asphaltum, gypsum, coal, borax, salt and cream tartar.

THE GREAT EXPOSITION.—The Exposition at New Orleans is attracting the attention of the press in all parts of the country and abroad. Almost every newspaper has something to say about the preparations that are being made to further the work of State or local associations. The special representatives of the Exposition, commissioned hy President Arthur, for the purpose of procuring exhihits, have found the newspapers ready to report speeches and print the latest news relating to the World's Fair. This circumstance, no douht, springs from the fact that the people throughout the land read with much interest, all that is printed concerning this great enterprise. By the wide-spread influence of the press, the Exposition is known and talked about in India, Australia, on the banks of the Congo, in the South American republics, and in the frozen regions of the North. Seeming impossihilities have heen overcome, and the scheme limited to a cotton exhihition at first, has been enlarged by degrees till it now embraces a grand exposition of arts, manufactures, mines, agriculture, and in fact, about everything in which the people of to-day are interested. This Exposition to be opened iu Decemher next, covers more ground, has more exhibits entered, than can be recorded of any other World's Fair ever attempted. Aside from the pecuniary means furnished the untiring industry of its directors, this marvel of the nineteenth century owes much of its renown to the power of the newspapers.

CUBIC FOOT OF ORE.—In the course of the trial of the Albion-Richmond mining case, there was a question of the weight of a cubic foot of ore. The *Sentinel* says: The first witness put on the stand for the Richmond side was L. W. Davis, the company's smelter and refiner, who, in company with Mr. Longley, Mr. McMillan and Mr. Humphreys, went dowu into the Richmond 300 level Sunday, and brought up for weighing a cubic foot of brown carbonate ore. By actual test on the scales it was found to weigh, within a pound, more or less, 135 pounds. There was a great deal of questioning as to how the cube was obtained, but the four witnesses agreed in their statement as to how it was done to get the measure accurately. They took dowu a sheet-iron hollow cube, open at two ends, and drove it into a five-foot breast of ore, and displaced its volume, as stated. The weight of the ore cube was found thus by the most practical method to be considerable less than the estimate made of similar ore by Col. E. N. Robinson. The idea of such a test is certainly original and ingenious. Col. Robinson's estimate was that it takes 10 cubic feet of ordinary Ruby Hill carbonate ore to make a ton of 2,000 pounds, or 200 pounds to the cubic foot. From other witnesses the evidence was obtained that the ore in Ore Body B would give an assay of $40 or $45 per ton, and also that the rock displaced in excavating this chamber was not all ore, but was mixed with an average of one-third waste.

CALIFORNIA SALT.—There are twenty-five salt works on the eastern shore of San Francisco hay, and the traveler by rail will see huge piles of salt all over the marshes at Alvarado and thereabouts. Shallow vats or ponds are formed, into which the water of the bay can flow at high tide. The warm sun, re-enforced hy the trade winds, soon evaporates a quantity of the water, which is then let into a number of successive ponds in which the same process is repeated until it is finally reduced to a brine. In the last pond, the floor of which is constructed out of boards, the salt crystallizes, and such portions of the brine as do not crystallize are manufactured into magnesia. San Diego and Los Angeles counties also have salt works operated upon the same principle. The only place where salt is made out of salt well water is in Siskiyou county. There is a well situated about six miles from Yreka and bored to a depth of 675 feet, throws up 10,600 gallons of salt water each hour. The well also discharges an uninterrupted flow of gas which burns with a bright yellow flame. The salt from this water is produced by allowing it to fall from a considerable height through brush arranged for that purpose.

THE Virginia (Nev.) *Chronicle* of July 26th says: Superintendent Boyle of the Alta mine has rigged up a queer apparatus for crushing quartz for prospecting purposes, and thinks he has found the germ of a practical working mill. It is merely an Ingersoll drill with a stamp attached, firmly set upright in a mortar. With a limited head of compressed air, the machine develops a wonderful appetite for quartz or anything else that may be fed to it, striking a blow equal to a 700-pound stamp, at the rate of several hundred clips a minute.

THE government is building the light-house on St. George reef, in Humboldt county, entirely out of granite quarried near Mad river. The deposit has been found to be very extensive, besides being located in a very favorable position.

THE Nevada City Mining Company are running their 20-stamp mill night and day and crushing from 40 to 50 tons of quartz every twenty-four hours. Each stamp weighs 850 pounds and drops 95 times a minute.

PRELIMINARY surveys are heing made to turn the Stanislaus river at a jutting point near Rolero's Ferry. By this means the bed of the river can be drained and minded for a long distance.

ENGINEERING NOTES.

Electrical Transmission from Niagara Falls.

At the annual convention of the American Society of Civil Engineers, Mr. Benjamin Rhodes read a paper, from which we condense as follows:

Dynamic electricity is used substantially only for the electric light, but this has become a great industry. It is the object of this paper to show what has been done and what may be done toward the utilization of Niagara for electrical purposes. The power of Niagara can be estimated very approximately. To utilize this amount of power by water wheels, generate electrical currents, and transmit to various cities within five hundred miles would necessitate a plant representing at least $5,000,000,000. Such figures as these give some idea of the enormous amount of power here in reserve.

A small proportion of the power of Niagara is already utilized for electrical purposes, and a much larger amount can be developed at moderate cost. Its use for this purpose has hitherto been limited to the local use of the electric light, but this use has been such as to give much valuable experience. A brush dynamo has been in use in Prospect Park for the illumination of the falls and grounds, since July 4, 1879. This machine is run under peculiarly favorable conditions, having always the same number of lamps in circuit, with power supplied by a water-wheel of proper capacity, and the plant operated only two hours of each day. The working has always been smooth.

A local brush company was formed in the fall of 1881, and has since been lighting the streets and dwellings of the village of Niagara Falls with from 40 to 60 lamps. The company has met with fair results in this enterprise.

The future application of Niagara's power to electrical purposes is an interesting subject. The local use will keep pace with the growth of the town, but will of course be comparatively small. In order profitably to transmit currents of electricity to a distance, several conditions must be observed: The cost of transmission must be less than the difference between the cost of steam and water power; the distant point must be one where the currents of electricity can be used, and where water-power can not be obtained.

There is no point so likely to fulfill these conditions as the city of Buffalo, and the project must be proved practical there before being attempted in larger and more distant cities. The cost of erection complete of a number of circuits of proper length would be about $4,000 per circuit, which would supply 100 lights. The size of the wire will be less for water-power than for steam.

Careful calculations show that the saving in the cost of the electric light by the use of water rather than steam would be $40,000 a year on 1,000 lights. Enough has been said and done to show that the power of Niagara can be transmitted to a distance of 25 miles with a great saving over steam, and that, with improvements in storage batteries and electro-motors, this distance can be increased with economy to from 100 to 150 miles. With further improvement in dynamos and insulating material, to permit the use of currents of higher intensity, the economical distance may be still further increased.

How Vessels May Pass Over Niagara Falls. An ingenious inventor has devised a plausible scheme to accomplish this end. In the longitudinal center of an inclined trough of sufficient length and size for the race or passage-way are cells, while in the sides are a series of triangular cavities. The water falls in succession into each cell as it passes down the way and forced from beneath into the triangular cavities and to the surface again. These cavities face the top of the way, and as the water rushes through them it goes upward, forming an upper current. The effects of the way is that a waterfall, or strongly flowing current, can be forced to run up hill instead of down. Thus will be afforded practically a stream running counter to the course of the falls. The inventor reckons that the inclined trough would have to be about 2,000 feet long, with a fall of one foot in forty. The current could be forced up the way with sufficient velocity to carry a tow of vessels to the top without any assistance from either steam or sails.

The Oldest Steam Engine, Perhaps.—From a recent item in the English papers we notice that an English firm, Geo. Atkinson & Co., of London, are about to remove from their premises an old beam engine, which has been continuously at work on the spot where it now stands 90 years. It is a Boulton & Watts engine, sun-and-planet motion, and both its beam and connecting-rod are of wood. This relic of former days should be carefully preserved in some museum.

Railroads in India.—Ten thousand eight hundred and thirty-two miles of railroad in British India are now open for traffic, and Mr. Juland Danvers states that the forthcoming annual report will show that the capital expenditure amounted to $713,034,500, including lines under construction; that the average cost per mile came to $56,500, and that the net receipts from all the lines were $42,094,500 for the year.

USEFUL INFORMATION.

Nickel in Kitchen Utensils. It is well known that acids have a more or less decided solvent action on nickel, and on nickel-plating; and inasmuch as the use of nickel-plated kitchen utensils (in Germany) is becoming quite general, it is a matter of serious moment to determine what would be the effect on the human organism of the nickel which may find its way into the food prepared in such vessels. An investigation, having this purpose in view, has recently been made by F. Geerkens, who affirms that as much as ½ gramme (about 7½ grains) of nickel may be taken into the stomach, and repeated for a long time, without producing any noticeably bad effects. When, now, it is considered that the quantity of nickel, which, by any probable means, could find its way into food in the course of its preparation in nickeled vessels, would be only a very fractional part of this quantity, there would seem to be no grounds for uneasiness in the use of nickeled kitchen utensils, especially where the same precautions are used as in the case of copper utensils -namely, thoroughly cleansing them and avoiding the storing of food in them. *Manufacturer and Builder.*

To Make Kofmiss.—Invalids for whom kofmiss is prescribed will hardly care to pay extravagant prices for it at the drug store when they learn that it can be made for fifteen cents a quart with very little trouble. Fill a quart bottle to the shoulder with good milk; then dissolve two tablespoonfuls of white sugar in a little water at high heat; add to it the milk and drop a quarter of a two-cent cake of yeast the latter must be fresh—into the mixture. What remains to be done is merely to stopper the bottle securely; shake the contents well together; leave the mixture to ferment for six hours at any temperature from 60 to 95 degrees F.; cool it in the ice-box over night, and drink it at leisure.

Mummy—What is It?—There is a pigment which paint manufacturers prepare for artists, called "Mummy." It is said to come from the catacombs, and is an asphaltum, which has become incorporated with the remains, and makes a rich transparent brown, which is used by artists in glazing and toning down effects. A manufacturer, who always had some doubt as to this pigment being what its name indicated, says, he was recently convinced, when a workman brought him a perfect section of a human vertebræ, which he preserved as an "antique" of some old fellow who "walked in Thebe's streets 3,000 years ago."

In preparing terra-cotta lumber, Gillman mixes one part pure clay, with one to three parts sawdust, and the requisite amount of water, and presses the mass into large blocks, which are dried and then burned for two days. The blocks are then cut into the desired shape with circular saws. Terra cotta lumber is incombustible. It resists acids and the influence of the atmosphere. It is a bad conductor of sound, heat and electricity. It is only half the weight of the same bulk of bricks, and it can easily be sawn, planed or carved. Finally, when put into a building, it combines intimately with lime, gypsum, etc.

A Substitute for the Bit.—An invention has recently been patented, which, it is thought, may eventually abolish that barbarous part of a horse's bridle known as a "bit." It is called the carrago, or anti-horse torture. It is composed of a steel band placed over the front bone of the horse's nose, and to this appliance the reins are attached. The inventor claims for this substitute for the bit that it gives complete control to the driver over the horse without inflicting the least discomfort or torture on the animal itself. It is said to have been tried with satisfactory results.

A mineral white, suitable for use as a pigment, may be prepared, according to Cobley, by converting the first magnesium sulphate into the chloride by the addition of calcium chloride. To this 10 per cent. of aluminium chloride is then added, and from the mixed chlorides a white precipitate of the hydrated oxides is thrown down by the addition of milk of lime. A cheaper white is obtained by the direct precipitation of the corresponding sulphates with milk of lime. These pigments do not discolor by the action of sulphurous gases, like lead pigment.

The Mechanics' Fair.—The opening exercises of the Mechanics' Fair will be held at the Grand Opera House at 2 P. M. next Tuesday. Prayer will be offered by Rev. M. M. Gibson, and the opening address will be made by President Cornwall. After a song by the Amphion Quartette, Frank M. Pixley will deliver the oration. A visit to the fair building on Tuesday showed that very few things were in place; but workmen were busy and doubtless matters will be in the usual state of forwardness by Tuesday next.

The Wear of Coins.—More than £11,000 worth of silver, remarks an English contemporary, is wasted every year in the course of the circulation of the crowns, half-crowns, florins, shillings and sixpences. One hundred sovereigns of the date of 1820, which were weighed in 1859 by Mr. Miller, showed a loss in weight through circulation, which was estimated at £1 6 7. There is more waste produced in the circulation of gold and silver coins than is generally thought of.

To Make Fly Paper.—Take of rosin, in clean pieces, four ounces: castor oil, two ounces. Melt together by means of a water bath, and spread on sized paper. If it should be an advantage to have something sweet, it is probable that glucose, thickened by an additiou of dextrin or gum, would be very attractive to the flies. But as this mixture would be liable to soak through paper in very hot weather, it would probably be safest to spread it on paraffined paper. *—Druggist.*

Another New Use for Glass.—The *Popular Science Monthly* records the interesting fact that an Italian ship has been sheathed with glass plates, cast like iron plates, so as to fit to the hull, to take the place of copper sheathings. The joints of the plates are made water-tight by the use of water-proof mastic. The advantages claimed for glass over copper, are its insensibility to oxidation and its exemption from incrustation. The suggestion strikes us very favorably, and we shall look for the result of the experiment with interest.

Peculiarities of Nitro Glycerine.—Writing of the peculiarities of nitro-glycerine as an explosive, a puzzled engineer asks an explanation of the fact that only small fragments—sometimes a hand, a foot, or merely a finger or toe—of persons killed by explosions of that compound are ever discovered. These fragments are often intact and uninjured, while the rest of the body has disappeared as completely as though it had been converted into vapor.

To Prevent Cinder.—A compound to prevent the fusion of cinder has been patented by Mr. Wesley Case, of Topeka, Kansas. It consists of bicarbonate of ammonia, saltpeter, bicarbonate of soda, resin and other ingredients, mixed and used after a designated manner, to prevent the formation of clinker in the combustion of coal.

Smalley writes that there is some variety of opinion as to the right pronunciation of "Pepys." It is commonly pronounced in London as if written "Peps," though in the lifetime of the diarist it was pronounced "Peeps."

Oil stains may be completely removed from tiles by the application of twenty-four hours of a thick paste of fullers' earth and water, the application being repeated if necessary.

Orange Peel is now said to be collected, dried in ovens, and sold for kindling fires. It burns readily and with great fierceness, and is safer than kerosene.

GOOD HEALTH.

Poisonous Sleep Producers.

The idea is gaining ground, and the *London Lancet* favors it, that it is just as sensible to knock a man down who needs rest, as to give him narcotics because he needs sleep. Sleeplessness, says the *Lancet*, is always wakefulness in one or more of its multitudinous forms, and the recourse to narcotic poisons for its relief is utterly unscientific and deplorable. It is as clumsy in theory—in so far as it can be said to have a theory—as knocking a man down because he needs rest. What is it that prevents the natural and physiological rest of the body at rythmical periods? The brain is as truly a part of the body as the stomach, and it is as much a fault of the organs of the mind to prevent sleep by mental worry or wakefulness, as it is a fault of the stomach to render sleep impossible by bad digestion. No intelligent practitioner dreams of narcotizing the nerves of the gastric organ to promote sleep. Why, in the name of common sense, continues the *Lancet*, should any medical man for an instant think it legitimate to narcotize the brain because *it* exhibits some disturbing irregularity in its functions?

Sleep is not a special prerogative of the brain. Every organ sleeps, and general sleep is the aggregate of many sleeps. It is time to protest against this clumsy procedure. If we do so warmly, it is because we feel that the mistake is of common making. It is so much easier to write a prescription or make up a bottle of medicine or a box of pills with one of the rank poisons that mimic sleep, and as they do so deprave cerebral and nerve tissue, than it would be to search out the real and active cause of wakefulness.

There are more than a score and a half of *known* causes or forms of sleeplessness, each one requiring direct and specific treatment, and yet, as by common consent, the profession sanctions the abuse of such drugs as chloral and bromide as "poisoned sleep" producers. No medical man is justified in undertaking the treatment of his maladies. It is impossible that he should so far step out of himself as to be able to form a reasonable judgment of his case *objectively*; and no practitioner has the justification of science for the recourse to narcotics as remedies for sleeplessness, except when an exceptional pain is the accidental disturber of a sleep function, or a habit of wakefulness may be broken by an occasional dose of the stupefier.

Contributions to the Germ Theory of Disease.—The researches of scientific men are slowly but surely increasing the sum of our knowledge of the nature of infectious diseases, and furnishing us with more effectual weapons with which to combat them. One of the latest contributions to this important theme is that made by Prof. Tyndall, in which he offers a plausible explanation to account for the hitherto unaccountable fact that a single attack of a number of the most fatal diseases of this class usually affords the survivor complete immunity from a second one. Prof. Tyndall suggests that, just as the soil may be so effectually robbed of some essential ingredient by one abundant crop as to be incapable of producing another, so in the human system a parasitic disease may so completely exhaust the blood of some ingredient necessary to the growth and propagation of the parasite, that the production of a second crop in such quantity as to be fatal may be rendered impossible. Thus it may be possible that only once in the lifetime of an individual his system may present the conditions suitable for the development of small-pox, typhoid, scarlatina, etc.; and having successfully passed through the ordeal, the body may have been so impoverished, or deprived of some essential ingredient by the first crop of parasites, that it becomes invulnerable to a second attack. This view certainly has great plausibility, and has lately been to a certain extent rendered more probable by certain researches of other experiments in the field of experimental physiology.

The Hygienic Effect of Patents.—In many of the later articles on the advantages attributable to our patent system we have seen tabulated statements to show saving in money and saving in time, but we have no recollection that any statistics have been offered to prove that we nwe more in health, and even in longevity, to patents than to any one cause. We want to see tabulated statements of the number of lives saved by the kitchen appliances which lessen toil and drudgery, or by the household articles which make domestic work rather a pleasure than a toil, or by the labor-saving appliances in the factory, the workshops or on the vessels. These devices each and all lessen toil; harness a motor into service for the brute work, and have the human being merely to guide and direct—to do the thinking, as it were. Consider how much more work can now be done per capita, and the minimum of physical labor required for it. In the mere item of traveling by land or by sea, what a gain in all that lessens the strain on the system? One now can almost go from New York to San Francisco in about the same time and with far less weariness or effort than was required fifty years ago to toil and moil over the long and dusty or dreary and muddy roads from New York to Washington. This general statement of physical and material gain is indeed true in all the departments of life work. Some scientists say that in less than the last fifty years we have added a half generation to the life span. We doubt if the true reason for this can be found in any other source than in the one we have above intimated.—*Ex.*

Length of Our Lives Increasing.—At a recent international health exhibition held in London, Sir James Paget delivered an address before the association, the Prince of Wales being present. The learned physician asserted that people live longer than formerly, and that less sickness prevails among the mass of people, and he then gives the following reasons for the decrease of mortality during the last few years: "There is less from intemperance, less from immorality; we have better, cheaper and more various food, far more and cheaper clothing, far more and healthier recreations. We have, on the whole, better houses and better drains, better water and air, and better ways of using them. The care and skill with which the sick are treated in hospitals, infirmaries, and even in private houses, are far greater than they were; the improvement and extension of nursing are more than can be described; the care which the rich bestow on the poor, when they visit them in their own homes, is every day saving health and life; and even more effectual than any of these is the work done by the medical officers of health and all the sanitary authorities now active and influential in every part of the kingdom. But we want," adds the lecturer in closing, "more ambition for health—a personal ambition for renown in health as keen as is that for bravery or for beauty, or for success in our athletic games and field sports."

A New Explanation of Mental and Nervous Disorders.—Dr. B. W. Richardson has offered a new and plausible explanation for the occurrence of various forms of mental and nervous disorders, namely: That they depend for their development on the presence in the body of certain organic compounds, formed by certain unnatural or abnormal chemical processes carried on within the body itself. He has proved that the substance amylene—an organic product that is sometimes formed in the body—produces phenomena identical with somnambulism. He believes, from his researches upon the action of lactic acid, that the presence of this substance in the body will account for certain forms of heart disease and rheumatism. Similarly he advances other suggestions as to the probable effect of other chemical compounds of poisonous nature which he believes may be developed in the body by abnormal processes, and discusses their possible relation to the causation of special forms of disease.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

CLEAN UP.—Amador *Ledger*, August 1: Another clean up was made last week at the Lighthouse mine, near Butte City, owned by W. E. Stewart and Herman Tripp, which yielded at the rate of $6 per ton. This amount leaves a good margin of profit, as the ore is worked at very little cost. Four men are employed at the mine and two at the mill, and five stamps are kept steadily at work. The big tunnel at Middle Bar is now in a distance of nearly 1300 ft. The formation through which it is at present passing is comparatively soft, and rapid progress is being made. The ledge has not been cut yet, and it is likely that another 100 ft or more will have to be run before a junction is made. The last clean up at the Iowa at Sutter creek, was richer, we are informed, than any previous run. The South Spring Hill has been much troubled of late on account of frequent breakage of hoisting machinery. The engine is not of sufficient power for the work it has to do. The mill, however, is kept pretty steadily at work.

SUTTER CREEK.—The mining outlook remains about the same, considerably mixed, and the question agitating the public mind is whether we are to be struck by lightning or have a spell of prosperity. Many think the one is just as likely to happen as the other. The men that were put to work in the 200 foot level of the Mahoney have all been laid off, on account of the ore being of too poor quality to pay. Twenty stamps of the mill were kept running four or five days, but were hung up as soon as it was evident that it would not pay. The contractors are making fair headway with sinking, and have already completed about one-half of their job. Mr. Stewart has a crew at work on the Lincoln ground. Everything about the Eureka is quiet. Only a few men are retained, who are employed in running a crosscut. The mill is idle, the pay rock being exhausted. I have it on good authority, however, that it is the intention of the company to commence sinking at once. The Voorheis sulphuret works will close down soon to undergo considerable repairs. New ovens are to be built, a large portion of the brick for which has already been secured. The works will remain idle for about two months.

Calaveras.

SILVER.—Cor. Calaveras *Citizen*, Aug. 2: Considerable excitement has prevailed at Sheep Ranch of late owing to the discovery of a rich silver lode, by John Swank, near Blue Mountain, on the south side of the South Fork of the Mokelumne river. For years past it has been the belief of mining men that Blue Mountain is a massive body of mineral although the baser metals it was considered predominated so extensively that the more precious treasure could not be found in rich enough strata to warrant working. However during the digging of Clark's ditch, near its head in the Mokelumne, the laborers found a bolder which when broken attracted attention and specimens of the ore were sent below for assaying, resulting in the report that the ore was rich—some say fabulously—running up to figures in the hundreds per ton. Subsequently parties interested in the discovery of the float, held a meeting, organized a company, and begun the work of running a prospect tunnel. Recently John Swank, learning the past history of the place, saw fit through the advice of his father, to do some prospecting in that section. He had worked but a few days when he made the lucky find of the rich vein above described, the rock from which is said by experts to be quite rich in silver. The lode was found by him a very short distance from where the operating parties years ago ceased their labors in the tunnel.

Inyo.

POLITA MINE.—William Irwin and Tom Luther, formerly of Bodie, have purchased a three-fifth interest in the famous Polita Mine opposite Bishop creek, and have also rented the Hawley mill, where they will crush several hundred tons of ore and ascertain the best method of reducing the same. They will then probably put up a mill near the mine. The C. & C. R. R. Co. are now putting in a side track at a convenient point for the transportation of the ore, and will also probably build a side track to the Hawley mill. Messrs. Irwin and Luther are shortly to be joined by Mr. Geo. Storey, and we have no doubt but this trio will make a success of it.

MAXIM MINE—Last Tuesday Mr. Nevins brought in from the Maxim mill seventy-seven ounces of gold bullion, worth fourteen hundred dollars. This bullion was obtained from seventy tons of quartz. The quartz contains a large per cent of sulphurets, and as there is no concentrator at the mill the loss must have been heavy. From the result of this run it is very evident that with concentrators and vigorous working of the mine, the Maxim would develop into a very valuable property.

DEFIANCE FURNACE.—At the Defiance furnace six tons of bullion are being turned out daily, being a yield of twenty per cent from the ore smelted. The bullion is all high grade. The mine and furnace are the property of Hon. P. Ruddy, who is a firm believer in the great value of the mines of the district, and is confident that immense profits will be made by working them.

MODOCK FURNACE.—The Modock mine and furnace at Lookout is turning out bullion steadily. There is now a large quantity of bullion at the railroad ready for transportation to San Francisco. Mr. Frank Fitzgerald, the owner of the property, is making a good run at the furnace. Messrs. Alexander and Kehoe will shortly make a shipment of ore from the Eclipse to Etna furnace, which will soon start up. Yesterday morning four miners left Lone Pine for the Beveridge district to work for Cohn & Straus. Three miners have gone to Kreggs' canyon to work the mine there and start the mill. At the old San Carlos mine a force of men will be put to work next Monday.

Placer.

RICH GRAVEL.—Placer *Herald*, August 2: A correspondent, writing from Pino, says, that about three years ago, George Lee sunk a shaft in his ground about three miles south of that place, and at 54 feet he struck a bed of river gravel about four feet deep, which proved to be gold bearing, and which averaged from eight to ten cents per pan. A year later he commenced a tunnel in the hill, and about 250 ft from the entrance the gravel came in overhead and gradually, but unevenly fell, until near the shaft, when he found the gravel from three to seven ft deep, and resting on the sandy or pebble stratum which underlies the old river bed. He washed out 260 cubic yards, from which he realized $2,600. The bed seems to be extensive, averaging about four ft deep and 60 ft wide. Mr. Lee, says the correspondent, has recently commenced work again, and his prospects are favorable for another big clean-up.

THE GOLD BLOSSOM.—Some weeks ago, in referring to a decision of the Secretary of the Interior, affecting the title of the Gold Blossom quartz mine in this county, we inferred that the case involved the whole of that company's property. It appears, on information from the party in charge, that the ground in dispute was a piece independent of the main property, and that the decision will not materially affect the company, since they retain all the ground on which work has been done, and on which their mill, hoisting works, etc., are located.

Plumas.

GREEN MOUNTAIN.—Greenville *Bulletin*, July 30: At this mine work is progressing and everything is running smoothly. The air drills which had been stopped on the 17th inst. in order that the air compressor might be repaired, were started Tuesday in the face of No. 2 blind drift. This drift will now be pushed to the east line of the chimney without delay. No. 3 blind drift goes steadily along, and fair progress is made, though the rock is exceedingly hard. No. 2 raise is now forty ft above No. 3 blind drift, and is in hard quartz. As soon as the raise connects with the winze from No. 5 level, the mine will be in good shape for easy handling of the ore of this chimney. The mill is running well at its full capacity.

FOREST KING.—The owners of this mine have leased the Arcadian mill for one month in order that they may test the ore. Though the mill has been running but a few days on the rock of this mine, the indications are that the ore is paying well. About twenty tons per day are being hauled from the mine. The quartz in the tunnel prospects better than the croppings. The vein is quite strong. A width of from four to eight ft is being removed.

San Bernardino.

PROVIDENCE NOTES.—Calico *Print*, August 2: The Bonanza King mine still maintains its reputation as being the richest silver mine in the State. It shows no signs of exhaustion, and rich pockets and veins are constantly being opened. The work is progressing smoothly and in a systematic manner. Under the able management of the general superintendent, Mr. Thomas Ewing, and his skillful subordinates, the mine and mill accomplish the highest possible results from the facilities at their command. The mine is yielding about $60,000 in bullion, each month, and has reached a depth of 550 feet, and work is progressing from the seventh level. Eighty men are employed in the mine and twenty in the mill. Perry Kerr's claim, situated about a mile north of Bonanza King, is still working a few men, and is improving in appearance. The shaft is down 80 feet with crosscut of 15 feet showing ore its entire length. The owners of this fine prospect lately refused $40,000 bond with a forfeit of $2,000. It is rumored that the last expert who examined the property will advise the purchase of the mine at $75,000, the owner's price. The original discoverers of this flourishing camp, Dwyre and Gorman, are still prospecting the Belle McGilroy mine south of the Bonanza King. They lately struck some good ore on the contact in good working ground. Their shaft is down about 30 feet and gives promise of a large deposit of carbonate ore carrying about 150 to 200 ounces in silver. Still further south the group of claims called the Lucknow, Mozart and Mineral Point, are also being prospected by the owners, Barrett, Cook and Thompson. Our reporter was shown some of the rock, specimens of a fair grade. There are about 250 people in the camp.

Sierra.

FOREST CITY.—Cor. Sierra *Tribune*, August 1: The mines, of course, are first in importance, for they support the other lines of business. Soon after the fire some seventeen months ago the South Fork Mining Company made arrangements with the Bald Mountain Extension Company allowing them to work a small portion of the South Fork ground. During the winter this furnished employment for about seventy men. It now employs thirty-five or forty men. It has well repaid both companies for the labor performed, and up to May 1st a little over $100,000 had been taken out. After deducting expenses quite a handsome dividend remained for the lucky shareholders. In the main tunnel bed-rock has been found, and everything looks encouraging for the other mines on that ridge. Of the Bald Mountain it is unnecessary to speak, for it is already widely known. They have, however, arranged to work a part of the South Fork ground, and it is the earnest wish of all that it may yield the coveted ore as abundantly as the part worked by the Extension Co. The South Fork location is a valuable piece of mining ground, and capital is the only thing needed to prove it so. It was prospected several years ago, when a lower channel was discovered which is entirely independent of that being worked by the Extension and Bald Mountain Companies. In the North Fork dump several of our citizens are prospecting for a new metal, the name of which I dare not try to spell.

Siskiyou.

PICK AND PAN.—Yreka *Journal*, July 31: Daggett & Lasource, at Buckeye Bar, are on bedrock with derrick, and are realizing good pay. A $14 nugget was found in their claim last week, which is an extraordinarily heavy piece for river mines. Jacobson & Crary will have their wingdam completed next week, by which time everything will be in complete working order. In the well-equipped claim of Cole & Mott, on Klamath river, the work of pumping out has commenced. They have also commenced sinking to bedrock. Leduc, Barton & Co., four miles below Oak Bar, have completed their wheel and are sinking for bedrock. They will realize pay this week. The Klamath Quartz Mine in the Salmon district has, in the past four months, paid $2,000 over and above expenses, and its prospects are brightening. The credit of the rapid development of this mine from an expensive experiment to a paying property is, to a great extent, due to the efficient management of Superintendent J. B. Tonkin. The mill is at present idle, owing to the failure of water, but will be started and run by steam in about six weeks.

HANKINVILLE.—Cor. Yreka *Union*, July 31: The water through the big ditch has at last reached us, and is used by several companies who are engaged in ground sluicing. Several breaks occurred in the ditch last Thursday, caused by the storm. Mr. Joseph Marie is busily engaged in cleaning and washing bedrock which he had ground-sluiced some three years ago, but was unable to clean up at that time on account of failure of water in the big ditch. We have noticed several new comers here who are engaged in prospecting for quartz or placer claims, and who, like ourselves, believes there are good mines yet to be discovered in this vicinity. John Miller & Co. are busily engaged rigging up their claim and making big preparations for ground sluicing.

Trinity.

CLEARED UP.—Trinity *Journal*, August 2: Miners in and about Weaverville have nearly all finished cleaning up, and, while they do not report figures, we understand that most of claims have paid better than last year.

LOOKING SPLENDIDLY.—Mr. T. C. Cox, of the firm Cox, Gibson & Co., owners of the Enterprise mine in Deadwood District, was in town this week and informs us that on Tuesday last they broke through the shaft connecting with the end of the tunnel in the mine, and were now happy in the possession of plenty of good air. The perpendicular raise is 142 feet, and in addition to giving them the much-needed fresh air, the shaft demonstrates the richness and extent of the lode. Mr. Cox had with him a splendid specimen of ore taken from the face of the tunnel the day before he came in, and informs us that there is plenty more of the same sort in the mine.

EAST FORK QUARTZ.—Mr. James Moor was in from East Fork this week, and from him we learn that the mine of Day, Moore & Co., is holding out well and paying as heretofore, the average of rock crushed thus far going over $100 to the ton. Parties of experience, recently in that section, and who have concluded to locate there, are reported as having given their opinion that formation and general indications in the East Fork District are the best on the Coast, and we shall expect to soon be called upon to chronicle more rich discoveries in that section.

WEAVER BASIN VS. COEUR D'ALENE.—Last week we mentioned the visit of Mr. Chas. H. Watt, of Placerville, to Trinity county, for the purpose of inspecting our mines and prospects generally, with a view to investment and possible location. He is an old practical miner, and has only recently returned from the Coeur d'Alene mining section. In private conversation, regarding the two sections, he said: "Weaver Basin has four times the mining ground that Coeur d'Alene has, and from what I have seen of both am of the opinion that Weaver will pay four dollars where the other will not pay four bits!"

NEVADA.

Washoe District.

ALTA.—Virginia *Enterprise*, August 2: After the diamond drill had been sent in to the eastward on the 2150 level to a distance of 92 ft the hard rib of black dyke was passed through and the west side of the ore vein reached. When the edge of the vein was cut a strong flow of water was tapped. The water was forced out through the stem of the drill so strongly that no samples could be obtained—all the drillings being blown about in jets of spray. The water is now being allowed to drain out. The west drift on the 2150 level is being pushed forward at the rate of about 50 ft per week, and in a few days will reach the belt of fertile ground passed through by the diamond drill.

SIERRA NEVADA.—The joint Ophir, Union Consolidated and Mexican winze below the 3200 level of the latter mine is showing improvement at the bottom. The bastard quartz is giving place to the genuine article, intermingled with bunches of porphyry. The winze is now down about 58 ft below the 3200 level. On the 3100 level work in the crosscuts is not being steadily prosecuted. Men are being shifted to that point from other places to keep them employed.

MEXICAN.—The winze on the 3200 level, which is being sunk jointly with the Ophir, Sierra Nevada and Union Consolidated Companies, is now making fair progress. It was yesterday down about 58 ft. Genuine quartz is now taking the place of the bastard variety which has for so long made blasting a difficult operation. Detached bunches of porphyry are still met with.

OPHIR.—The west drift on the 500 level is now being rushed along at the rate of 60 ft per week. On the 250 level of the old works some paying ore is still being obtained from the fillings of the old drifts.

HALE AND NORCROSS.—The diamond drill having been run in various directions on the 2800 level to feel for water, and all being considered safe, regular work at drifting was resumed yesterday morning. From the ore body on the 200 level they continue to ship about 400 tons a week to mills on the Carson river. Last Monday there was sent to the Carson mint 4,300 ounces of crude bullion, being an additional return of bullion from the Eureka mill on last month's account.

GOULD AND CURRY.—The joint Best and Belcher west drift on the 2500 level is now being advanced at the rate of about 60 ft per week. Some promising quartz streaks have been cut through and the porphyry is becoming softer.

BEST AND BELCHER.—On the 2500 level the joint Gould and Curry west drift is making about 60 ft per week. It is now in softer ground than heretofore, and is showing some quartz of promising appearance.

CHOLLAR.—The main south drift on the 2800 level has been pushed forward at the rate of over 60 ft per week. They have now reached the point where crosscutting will commence.

YELLOW JACKET.—A good deal of low-grade ore is still being extracted and sent to the mills. While the ore already opened up is being extracted a considerable amount of work is doing in the way of running exploring drifts.

UTAH.—The southeast drift on the 1950 level is being advanced at the rate of about 30 ft a week. It is passing through vein porphyry, with seams of clay and occasional feeders of quartz.

CROWN POINT.—About the usual quantity and quality of ore is being mined and sent to the mills. A considerable amount of ore is being opened up by the prospecting drifts.

ANDES.—The winze is fast nearing the vein, where it is expected some paying ore will be found. The north drift is in quartz showing occasional bunches of low-grade ore.

CONSOLIDATED VIRGINIA.—The diamond drill is still being run on the 2900 level. The ground is found to be wet and the water is becoming very hot.

Bald Mountain District.

SLUICING FOR GOLD.—Eureka *Sentinel*, August 1: John Adams, Smith Fuller and several other miners have taken advantage of the unusual snowfall, and consequent large supply of water in Bald Mountain, to sluice for gold. They have to work at considerable disadvantage, but for the last month or so they have got out an average to the man daily of about $3. They get a color any place along the ravine, and in some places find little nuggets running from 50 cents to $1.50 in value. The gold is coarse and harder as they go down, and they are now working for bedrock, where, perhaps, they may make a good clean-up. Since starting into work they have found gold for a distance of some 400 or 500 yards in the gulch, and above where they had supposed the cross-ledge to be, from which the supply of gold originates. The Judge and Mr. Fuller thinks that they have a bright prospect for finding the mother lode, and they believe that when they do, Bald Mountain will be the scene of the next grand rush and excitement. They were surprised, after digging down some seven or eight feet through the loose dirt and gravel, to find, along quite an extent of the ravine, here and there, small quantities of native quicksilver resting in crevices on the compact gravel. There has been some sluicing in the ravine before, and quicksilver has probably been used, but not where it is now found. It is evident from the circumstances that the metal is deposited, in the state discovered, by some natural process. As everybody knows, quicksilver is ordinarily found in the form of cinnabar, from which it is extracted for use. It does not always occur in the form of ore, however, and is sometimes, though rarely, found in a pure state. The books tell us that when it is so found, it is in proximity to mercurial ores, from which it has been eliminated by chemical process in nature's own laboratory, as bluestone is found crystallized near by deposits of copper ore. Hence, possibly, the gentlemen sluicing for gold on Bald Mountain may be working in the neighborhood of a deposit of cinnabar. If so, they have a better thing than even gold to prospect for.

Columbus District.

MOUNT DIABLO.—*True Fissure*, August 2: The north crosscut from winze No. 5 has been stopped after reaching a length of 34 feet, and a west drift has been started on the ore body cut by the same. The west drift on the third level has been stopped, and a south crosscut started from the same is now in 15 feet, and shows a strong ledge of low grade. A north crosscut, from the east drift on the third level, some 75 feet east of the shaft, is now being extended. The west intermediate, between the second and third levels, is in 126 feet, and shows but little of value. A small amount of ore is being taken from the west drift in a winze on the first level, and there is a small streak of ore near this place. The west drift on the fourth level has been driven 13 feet during the week, and shows a little ore in the face.

Garfield District.

MILL.—Bodie *Free Press*, July 28: The mill being put up by Farrington, near Garfield, will be in running order about the first of next month, and he will start in working rock that will go in the neighborhood of $500 a ton. Farrington has his three mines—the Western, Allington and Bell—now running. A five-foot ledge has been developed on the Bell and the rock is very rich. Mr. Moss has discovered a very good prospect which he is now working nine men on. The rock contains only gold, is free milling and very rich. A shaft has been sunk 200 ft and the ledge cut two or three times. As soon as a good mill site can be found Mr. Moss will put up a ten-stamp mill. Work is going on in the Hindley mine, owned by some Dayton parties, and the prospects are good. Two men are working and have a tunnel in 600 ft. A ledge was struck at 450 ft that carries ore assaying $200. The vein is a small one. Archie Farrington will put about fifty men to work in his mines in a short time.

Gold Run District.

COMMENCED OPERATIONS.—*Silver State*, July 29: The Great Republic Company, a San Francisco corporation, has commenced operations on their mines in Gold Run District, twelve miles from Golconda. They have two leads, one of which is thirty or forty feet wide, and both carry considerable ore of a low grade. It is the intention of the company, if the developments warrant it, to build furnaces for reducing the ore at Golconda.

Star District.

A VALUABLE MINE.—*Silver State*, July 28: J. H. MacMillan, who has just returned from a visit to Star District, informs us that the prospects in the new mines of that old camp are good. There are seven men at work on the Grizzly taking out ore, the first quality of which nets $1,000 per ton in San Francisco, and the second-class, from $250 to $400 per ton. The owners have employed Alex. Wise to haul fifty tons of the ore from the mine to the railroad at Mill City. A carload of the first-class ore will be shipped to San Francisco this week, and the remainder will be worked at Mill City, the mill at which place is expected to start up about Wednesday.

ARIZONA.

RIVERSIDE AND MINERAL CREEK NOTES.—*Silver Belt*, August 3: Mr. Charles E. Taylor, who returned on Tuesday from Riverside and Mineral Creek, reports matters, particularly mining, in that district as exceptionally brisk. He noted a number of improvements at Riverside. The 30-ton water jacket furnace is being repaired and will soon be ready for use. At the Ray mine on Mineral Creek, six miles from Riverside, there is unusual activity, and a town is rapidly springing up. The Ray Copper Co. have in process of erection concentrating works which will have a capacity of 75 tons. They

are completed with the exception of the roof, the iron for which has not yet arrived. They expect to have everything in readiness to start up on the first of next month. Nothing is being done in the Ray mine at present nor will there be until the reduction works are completed. There is a large quantity of ore on the dump. Work is being energetically pushed on the Poorman mine, belonging to the same company, and it improves as the development progresses. The Old Dominion Co. has a very promising property known as the "Mineral Creek," but it is not being developed at present. One of the richest claims in the district is the Monarch, owned by D. H. Snyder and Dr. T. C. Stallo. Considerable work has been done on it and the mine is developing finely. Miners who have worked in the Ray say they would rather own the Monarch than the Ray. Mr. Snyder will continue work on his claim. The Mineral Creek district is undoubtedly one of the richest copper districts in the territory. There appears to be a belt of mineral two to three miles wide, running from Mineral creek in a southeasterly direction, crossing the Florence road at Cane springs, and extending to Tweed's camp on the Gila. The success of the Ray Company will make this district one of the most prosperous in the territory.

COLORADO.

NOTES.—Georgetown *Courier*, August 2: Two more Rouse tables have been added to the Cory mill. Some good ore is coming out of a few lodes on Irwin's Peak. A run from the Bright Lode in Daily district, gave 328 ounces silver to the ton. The last mill run from the Kongsburg Lode, on Democrat Mt., gave 650 and 375 ounces silver to the ton, according to class. Every lessee on the Baltimore mine is reported to be doing well. Bryant & Co. are steadily shipping high grade ore. Peterson & Co. recently encountered fine mineral which promises to pay them well. Work at extending the adit on the Montreal, Brown Mt., is steadily progressing. The adit is now in 440 feet, and approaching the point beneath the rich ore pocket discovered a number of years ago. The property is located in a hot-bed of rich mines, and will undoubtedly prove very valuable. It is owned by the Montreal G. and S. M. The contract to extend the drift on the Corry City vein No. 3, Diamond Tunnel level, has just been completed. This drift is now in 125 feet, and in it has been found the first rich mineral discovered in the tunnel workings. The tunnel company is now considering the letting of a contract to extend this drift to a point under the Corry City discovery from which they will commence raising.

UTE CREEK.—Gow Bros. have a very flattering prospect. Although the developments are very meagre, there is enough to show an experienced miner that it is a good piece of property. Carbonate of copper, black and gray sulphurets and native silver runs from Grassroots, and as depth is gained the mineral improves in quantity. The Andes, Argosie, Alexander and Livingston are all good looking prospects, and all showing more or less mineral. We understand, Dr. Hoop, of Idaho Springs has bought the Humboldt property. He has six men at work, and as ground is opened up, the force will be increased. This is the best developed mine in the camp, and more money has been taken out than any other. It is one mine that has paid its way, and there is enough money in the dump to do as much as has been done.

DAKOTA.

THE TIN MINES.—*Pioneer Press*, July 28: The discovery of tin ore marks a new and important epoch, not only in the history of the Black Hills, but in the history of metal mining in the United States; for, although small finds of stream tin have occasionally been reported in America, nothing in paying quantities, and in no instance tin ore—cassiterite—has been heretofore discovered. The Black Hills have both; there can be no question of it. The doubting period has passed; the existence of a tin belt sixty miles long has been unquestionably established. They find it at Sand creek, on the north, and at Harney's peak, on the south; at Rockford, midway between those points, and unmistakable evidences everywhere. True, no vast amount of work has been done, so secret is the discovery, but developments are sufficient to convince the most skeptical of all that I allege—like Mercutio's wound, it is enough. The most prominent metallurgists of America, such as Professor Riotte, of New York; Professor Bailey, of Cheyenne; Professor Phelps, of London; Professor Hulst, of Milwaukee, and others, have given the district the most critical examination, and have pronounced in its favor. The ore assays from five to seventy-five per cent. The famous mines of Cornwall do not average over three per cent. You can, therefore, draw your own conclusion as to the value of the Black Hills tin mines. The Etta was recently sold to a New York company for $21,000, and is being rapidly developed.

IDAHO.

VIENNA.—Wood River *Times*, July 30: Mike Rose is down from Vienna, to see what arrangements can be made for shipping his ore. He says that he has from 18 to 24 inches of ruby silver ore in the Silver Circle, from which he is extracting about a ton per day. He reports Vienna quiet, but prosperous. A new strike was made in the Vienna mine about a week ago, and there is not now one idle man in town. Additional men are being put to work every day. Mr. Jessen, who is managing Smiley's Emma for the new owners, has just put half a dozen men to work, and will erect buildings and lay in supplies for permanent working. Superintendent Childs, of the Solace, is in Vienna, but not doing anything. He seems to be trying to make arrangements to lease the Vienna mill for a run of his ore.

MONTANA.

ORE.—*Inter-Mountain*, July 31: Drifting and stoping continue on the 150 foot level of the Poser. The first-class ore is sent for reduction to the Moulton mill. The second grade ore is accumulating on the dump which now contains over 600 tons on an average assay value of 30 ounces in silver. Crosscutting has begun from the 320-foot station of the Clear Grit. Active sinking continues on Clark's Colusa. The upper levels are producing about 40 tons of ore daily on mixed grades. A shaft is being sunk on the west Colusa, or Ganibetta, owned by the Montague Copper company. Sinking was begun soon after Mr. Saly Rauuheim left on such important business for New York and it has since been prosecuted to a depth of about 100 feet. Daily shipments of crude ore averaging forty tons continue to be made from the Liquidator. The equipment of the mine is now complete, a well appointed assay office having lately been added as a necessary precaution. The character of the product is somewhat changeable, and the extraction of the best ore is greatly facilitated by frequent assays. The Liquidator is a well managed property. The Mint, a prospect adjoining the Orphan Girl on the west, has been leased by Henry Thompson. The Moose shows some excellent ore in the north shaft. It looks like worthless talc, but assays handsomely. The Gagnon is looking well on the 600-foot level, and is producing considerable ore. The Anaconda has shipped no ore since the 26th inst., but will resume to-morrow. During the month 28,000 tons of ore were raised of various grades. This is almost a thousand tons a day. The record was never beaten in the history of western mining operations.

THE COLUSA SMELTER.—*Inter Mountain*, July 26: The smelting plant of the Montana Copper Company consists of ten calciners, six matting furnaces and one blast furnace. The average product of the mine is 120 tons daily, of which 75 tons are put through the concentrator, the remainder being smelted into matte without preliminary treatment. The matte product of the works is about 25 tons per day, assaying from 60 to 70 per cent copper and containing considerable silver. The blast furnace is not at present operating. During the present year it is more than likely that the capacity of the works will be increased, but this depends partly on the nature of future contracts to be made by the company, and also on the work of development now progressing on the Parrot fraction and the Colusa. The mine is stated to be looking well and an important strike of high grade silver-copper ore is reported in the east 400 foot drift in an upraise. The company employs 225 men and ships over the Northern Pacific.

BLUE WING DISTRICT.—Dillon *Tribune*, July 28: Messrs. Trask & Graves, who are the owners of extensive silver mining properties in the Blue Wing district, and who also own large interests in the leading gold properties of the Bannack-Marrysville district, are putting a plant on the Ruby mine, which is located in the first named district. This is the first move toward revolutionizing the manner of working the Blue Wing mines, which have heretofore been worked by the slow and unprofitable way of hand-windlasses and man muscle for power to hoist ore and water. The steam hoist and pump are on the ground, and will be put in position shortly. In opening the Ruby drainage will be given to the Erie mine, another valuable property owned by Messrs. Trask & Graves. When the machinery is put in motion we will give a more detailed report of this mining enterprise.

STEADY PRODUCTION.—Butte *Miner*, August 1: The Liquidator keeps on the even tenor of its way. Operations are confined chiefly to the 300 ft level, and averages 100 tons a day, of which 40 tons daily is contracted for and taken by the Montana copper company at $15 per ton net. This gives the Liquidator people a steady income of $600 per day. Last month the Montana company took 1,200 tons of 25 per cent. ore, and this month the Liquidator will supply 1,100 tons, which will realize almost $20,000, as the ore will sample 28 per cent. On the dump are about 15,000 tons of low grade ore, worth as it is, $6 per ton, or $90,000. This, it is stated, will also be taken by the Montana company before the expiration of the contract, which will end in two months. It is in contemplation by Superintendent McDermott to remodel the old Clipper 5-stamp mill, and convert it into a concentrator for the treatment of the Liquidator product, which samples less than 20 per cent. This enterprise will render available, for extraction, a vast amount of ore in the 100 and 200 ft. levels of the mine, and will more than double the present output.

NEW MEXICO

GOLD GULCH DISTRICT.—Silver City *Enterprise*: The Gold Gulch district, as named at the meeting of the locators and miners of the camp, includes the country south of the Burro Mountain district, and runs from the Angle peak on the south of the Burros, 14 miles northeast of Lordsburg, west 25 miles to what is known as Flat mountain, thence 20 miles northeast to Round Top mountain, near Burro springs, thence circling to Angle Peak, the place of commencing. The district embraces Gold Gulch and Thompson's canon, and a large unexplored country west of soldier's Farewell. The new camp was named Malone, and is located about one mile east of Thompson's canon, near the largest mine in the district, if not in the territory, considering development. In no district that we have ever visited have we seen as large leads and deposits of mineral bearing quartz, and in the language of Col. Donahoe, of Knight's ranch notoriety, "The formation of the camp has put science at defiance. Mineral in nearly every form is found in nearly every formation known to mineralogy. The largest and best prospect in camp is in litigation, there being two claimants for it, which is much to be regretted. The Young Man claim, as it is located by Messrs. Rutter Bros., Mikesell and Ficel, and the Horseshoe claim, as it is known in dispute, by Messrs. W. P. Dorsey, Potter, Miller, Banker and Noel, is an immense outcropping of quartz running very high in gold and silver. The lead in place crops out at one point about forty feet in width, and the lowest assay from samples taken from this outcropping, is $15. There are two openings upon the claim, both of which are in good grade mineral, and the upper one of which is in extraordinarily high grade ore, considering the quantity. Flood & Mackey's expert, from California, who has carefully examined the claim, believes it to be the largest deposit of high grade mineral in the country, and intends to return with an assayer to carefully sample the property with a view to purchasing the same. The outcropping on the backbone of the mountain, upon which the claim is located, measures twenty-five feet from wall to wall, and is in good mineral the entire distance, scarcely a piece of the ore from which native, sulphide or horn silver cannot be found at a glance. The rock also carries from eight to twenty dollars in gold. Southeast of the initial location of the camp, several claims that have been discovered are being worked by the owners. Geo. Goodwin has also struck two claims, both of which show horn and sulphides, and the ledges give promise of permanency. In Thompson canon there is some gulch mining going on, but at present very little, if any, gold is being taken out. Mr. Alexander has built a dam about a mile from the mouth, and is experimenting on the "booming" system, but thus far has not had water enough to uncover the bedrock. On each side of the Young Man mine, Rascom Bros., James and Watts, have claims on which considerable development has been done, and on both of which good ore is opened up. These claims give promise of developing into fine mines with a little work. There are many other fine properties located within a short distance of the original find on which the same character of ore as that of the Young Man is found, and which lack but development to show them up. There are many prospectors searching the adjacent hills, and some good prospects are reported outside the ones above described.

OREGON.

CLEANING UP.—Jacksonville *Times*, August 3: Miners on Grave creek have finished cleaning up. Jack Layton, of Farris' gulch, will soon finish this year's run. Wimer & Sons, of Waldo, have about finished cleaning up for this season. Sargent Bros., of Steamboat, have resumed rocking, and are making good wages. Gin Lin is piping away at his diggings in Uniontown precinct, and seems to be doing well. Work still continues at the hydraulic mines of McCall & Anderson on the hill northwest of the Eagle mills. One thousand dollars worth of gold-dust was cleaned up at E. K. Anderson's diggings, southwest of Phœnix, this season. Goff & Co., who have excellent mines in the Grave creek district, made a successful run this season, everything considered, cleaning up a nice lot of gold-dust. Wm. Bleckert, of Gall's creek, was in town during the week, who informed us that the miners have done tolerably well, all things considered. A heavy storm in the mountains demoralized the Sterling's company's ditch for quite a distance one day last week. The damage done was repaired in a very few days, and cleaning up is again progressing there. Mr. Caldwell informs us that active operations have ceased for the season at the Steamboat mines. Considering the scarcity of water, the result has been favorable. A piece, weighing $25, was picked up in Caldwell & Son's diggings.

UTAH.

PARK CITY NOTES.—Park Mining *Record*, July 28: The lumber for the concentrator is on the ground and we are informed that work will be started on the same next week. The Smelter has been running for the past week, and the familiar sound of its whistle makes one feel as though good times were going to come to the Park again. The Parley's Park mine, which has been engaged in a search for the Ontario vein east for several years past, has finally given up, and the pumps, etc., have been raised to the surface and the mine shut down. A vein of ore has been struck on the City of Rome and Conkling mining claims, and the parties owning the claims feel greatly encouraged thereby, and intend pushing work right along on those claims. These claims adjoin the Black Bear and Disappointment mining claims. There has been quite a large land slide on Jupiter hill on the Gen. Dodge and Liberty mining claim. The slide took in a surface of over five acres and carried everything before it, but did not do any great damage, other than crushing in some fifty-five feet of tunnel on the Gen. Dodge claim. We understand that the owners of the Morning Star mining claim have leased the same to R. and A. Mulhall, and that work will be begun at once on that property. Work was commenced on the Crescent tramway on Wednesday, and it will be rapidly pushed along to completion. Mr. F. H. Dyer has taken the contract for the work, and has sub-leased part of the work to other parties. On the completion of the tramway the Crescent Company will have a way of getting their ore down from the mines that they can rely upon, and the route that has been chosen is one that is comparatively free from snow in the winter, and the grade is the lowest that could be found after a number of surveys, being about 400 feet to the mile.

REVIEW.—Salt Lake *Tribune*, August 1: The week has been a warm one, and the movement of the metals has been fairly active. For the week ending July 30th, inclusive, there were received in this city bullion aggregating $117,044.05 in value, and ore to the value of $0,320; total value, $126,364.05. The Horn Silver shipped in eighteen cars of bullion, valued at $54,000, making the aggregate shipment for the present year to date, $1,378,000, from which two quarterly dividends of $300,000 each have been paid. The Ontario shipped for the week forty-six bars of bullion, of the value of $32,914.05, making the total shipments of this company for the present year to date $950,996.44. The Crescent made three shipments of ore during the week, of the value of $9,320, being all the ore received. The Stormont sent up two bars of silver, assaying $2,080. The product of the Hanauer smelter for the week was nine cars of bullion, $25,450. For the first time in many months we have a car of bullion from the Park City smelter, showing that it is again in blast. The car is valued at $1,750. Mr. Hampton says the amount of ore in the Cave mine, Beaver county, and its general appearance justify the extension of a spur out from Milford to the base of Cave mountain, which has been talked of for more than a year, and which has only awaited the present condition of things to be done. So it is to be done. The Cave tunnel extends 1,200 ft into the mountain from the Cave; then an incline at an angle of 45 has been driven down from the end of the tunnel, where they have struck water. There is a tunnel below the Cave or main tunnel, 175 ft vertical, through which the mine was worked in the first years. A new tunnel, 2,100 ft long into the foot of the incline where the water is, has been begun, and 300 ft of it excavated, starting at the base of the mountain, 125 ft below the old tunnel. This is being driven in very cheaply, men working for their board, but to have their wages out of the first ore struck. No doubt ore will be struck before long, as the mountain is full of channels of ore, striking off in all directions and pitching at all angles, and winding about without apparent law or reason. Above this lower tunnel there will be hundreds, if not thousands, of feet of mountain full of these ore deposits to exploit and work out. The ore is the finest in Utah in some respects, the gangue being iron and invaluable as a flux. The Summit, which divides the hill with the Cave, something as the Eureka Con. and the Richmond divide Ruby Hill, has recently changed hands at $20,000, and development work on it, so far reasonably encouraging, is to be continued steadily.

THE CAVE.—Salt Lake *Tribune*, July 25: The Cave mine, in Bradshaw district, covers largely the face of a mountain rising 3,000 ft above Milford. The ore occurs in a series of channels or caves, now enlarging, now closing, but ever as they extend into the heart of the mountain, becoming richer and carrying a larger proportion of gold. The inner workings are taking more and more a direction at right angles with the face of the hill; in other words, pitching more and more downward. The working tunnel runs in 1,000 to 1,500 ft from Discovery Cave, and then, following the ore becomes an incline, at the head of which a hoisting engine has been set up, and the bottom of which has struck water. Steam is made in Discovery Cave, which is a vast natural rock "tepee," and taken in in pipes. It can be truthfully said of this mine that the more there is done on it, the more valuable it appears to be. It has been worked, more or less, these ten years, but its capabilities just begin to dawn on the owners.

THE HORN SILVER continues its output of about 140 tons of ore a day, and shows no signs of exhaustion. On the sixth level, in one place the pay ore is 200 ft wide, or thick. The chimney promises to be longer below. The new hoisting works are being erected and a new three-compartment shaft is approaching 300 ft in depth. The machinery and everything is designed to work to a depth of 2,000 ft. Water is expected at the level of Beaver river, perhaps 1,200 ft down the shaft. There is no known reason why such an ore chimney should not go down indefinitely. At all events, the owners would not willingly leave it short of the 2000-foot level. Mr. Fyson is opening a copper-silver lode in Newfoundland district, samples of which assay 16 copper and 126 silver. At a depth of 20 ft there are three ore veins within walls six or seven ft apart. Doubtless they will come together, deeper, and make a good strong vein of paying ore. One goes out there by the Central Pacific to Terrace, then by wagon.

WASHINGTON TERRITORY.

RICH COAL DISCOVERY.—Kiltitas *Localizer*, July 28: We hear from authority that is deemed reliable that the coal deposits on the Cle-el-um are unparalled in this country. The surface vein is said to be from twelve to fourteen feet deep, while an under-stratum, separated by a layer of slate, is being sunk down on, and is more than six feet deep, and the bottom not yet reached. This under-stratum is of a much better quality, and has a glistening jet color. Coal of the upper stratum is now in general use by the blacksmiths of this place, and they pronounce it an excellent article. Its value is being appreciated here so much that it is superseding the use of charcoal. The Cle-el-um coal-bed, where it is being developed, is the richest strike yet made in the Territory, and the quality of the second stratum, perhaps, the very best that has yet been discovered on either side of the mountains. It will be seen that the Cle-el-um district is not more celebrated for its rich quartz mines than for its valuable coal and iron deposits. We shall have more to say of this coal-find in our next, when we shall know more about it.

FROM CLE-EL-UM.—Cor. *Localizer*, July 14: Today Mr. Bills leaves here with a load of coal from the Cle-el-um mines, located about two miles south of Cle-el-um lake, and two miles northeast of Cle-el-um river. I saw an item in your paper that located this coal mine as being on the Teanaway. This is a mistake. The mine, from which the first load of coal was brought to Ellensburgh, is about twelve miles from the Teanaway—that is, from where it is crossed by wagon-road; and located as above described. Coal was found on the Teanaway about five years ago, by Geo. Verdin, but not in paying quantities. My first discovery of coal was made on the Snoqualmie pass about four years ago. The coal was of anthracite quality, and after locating thirty parties we went on prospecting for a paying quantity. We spent about $6,000, but without success. Hearing there was coal found in this part of the country, I came here last August to see for myself. I was successful in finding several veins near Cle-el-um lake, and some parties from both Seattle and Ellensburgh were located by me.

PESHASTIN NOTES.—Cor. Kiltitas *Localizer*, July 18: The Peshastin mines show more good rock at present than at any time since their discovery. The Hummingbird has about 500 tons of rock in sight that will mill from $15 to $30 per ton in free gold in the stopes. The lower level taps the ledge at a depth of 125 feet; and in the west face of the tunnel the formation indicates nearness to the main shute. The lead in sight is 15 inches in width of heavy sulphurets ore, that carries some free gold; the sulphurets carry from $80 to $300 in gold, which is worth $17 50 an ounce. Adjoining the Hummingbird is the Bob-tail, the vein of which will average about four feet in width for a distance of 200 feet, of ore that will mill $12 to $15 per ton in free gold, and there is about 75 tons on the dump. Adjoining the Bob-tail is the Schaffer lode, with a tunnel over 300 feet in length, in ore that varies from six inches to five feet in thickness, of ore that will average $25 a ton in free gold. The summit pocket has about 400 tons of quartz in sight that will pay from $20 to $60 to the ton in free gold. The company has a six-stamp mill on Peshastin creek, near the mines. This mill is a credit to the men who built it, considering that neither of them ever saw a quartz mill or mine before they went to Peshastin. The company has about 75 tons of sulphurets and tailings saved for other machinery, that is to be specially built for working base ores. There is also the Pole-pick mine, that has a good showing to become good paying property; and the Golden Phœnix, which is the richest free-gold mine in the district; the vein is from four to twenty inches in width, which if properly worked will pay $175 per ton. The sulphurets ore assays from $300 to $4,000 per ton. The ore in sight is sufficient to satisfy any experienced miner that the camp is destined to become one of the paying properties of the territory.

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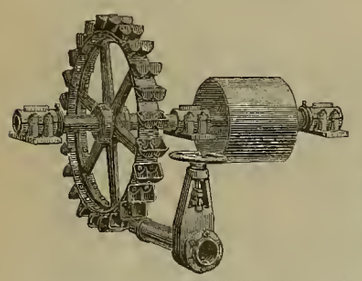

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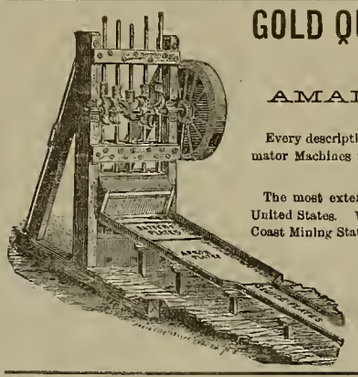

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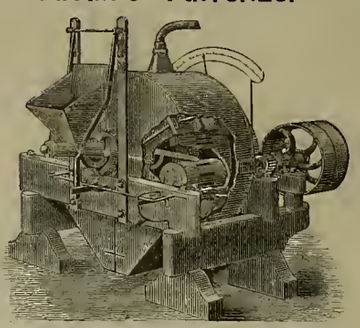

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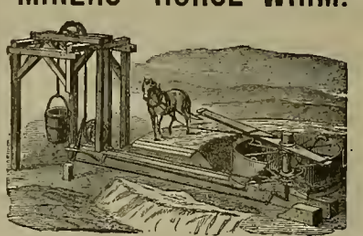

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Ingersoll, E, 3½", medium ports	1.601	" "
National, improved, 3½"	1.230	" "
Rand, improved, 3½"	1.041	" "
Ingersoll, D2 3", beat Rand 3½"	.744	" "
Ingersoll, D2 3", beat National 3½"	.505	" "
Ingersoll, E 3½", beat Rand 3½"	.560	" "
Ingersoll, E 3½", beat National 3½"	.321	" "
National beat Rand	.139	" "

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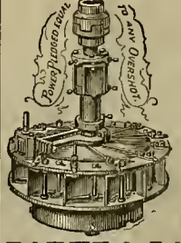

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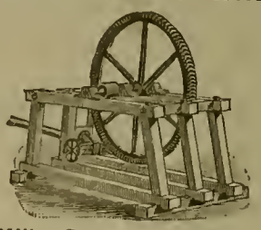

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Mining Share Market.

Stocks have been on the down grade this week, much to the disgust of those who thought the rising market would continue for a while. There were no special developments to start them up in the first place. On the Comstock they are working away prospecting as usual. At the north end the joint Ophir, Sierra Nevada, Union Consolidated and Mexican winze is down about 58 ft below the 2300 level. Genuine quartz is now beginning to take the place of the bastard variety that has heretofore predominated. As yet this quartz gives no assays, but is metal-bearing in appearance. There are still encountered some detached blocks of porphyry. At the Sierra Nevada they are now advancing west crosscut No. 1, following up a diamond drill hole that was run last winter. At the Best and Belcher and Gould and Curry they are making rapid progress in the joint drift on the 2500 level, and are finding favorable material. At the Hale and Norcross they have explored for water in various directions with the diamond drill, and finding all safe, regular work was resumed on the 2800 level by a force of miners. The management are reticent in regard to the exact nature of their present operations. At Gold Hill the Yellow Jacket, Crown Point, Belcher and other mines that are at work on the old upper levels are taking out and shipping to mills on the Carson river the usual quantity and quality of ore. At the Alta they are pushing forward the west drift on the 2150 level. In about another week it will enter the fertile belt of ground (200 ft wide) that was tapped a short time since by the diamond drill.

Prompt Payment Needed.

It would be of great assistance to the publishers of this journal to have all its patrons renew their subscriptions promptly, save the expense of collections, avoid the changing and shifting of the position of the names on the printed mail list, and prevent some of the chances of errors occurring in addressing and mailing our very large list of subscribers. We, therefore, kindly urge upon all those who possibly can to renew their subscriptions early.

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Hanauer, July 29, $11,500; Crescent, 29, $3,450; Horn Silver, 29, $8,294; Stormont, 30, $2,980; Hanauer, 30, $5,450; Ontario, 30, $4,104; Horn Silver, 30, $12,000; Park City, 31, $1,750; Crescent, 31, $2,270; Horn Silver, 31, $6,000; Ontario, 31, $4,248; Hanauer, Aug. 1, $4,500; Nevada, 1, $4,300; Horn Silver, 1, $12,000; Ontario, 1, $4,011; Hanauer, 2, $2,050; Park City, 2, $1,700; Horn Silver, 2, $3,000; Ontario, 2, $10,874; Bodie, July 3, $4,380; Bonanza King, 25, $8,530; Navajo, 28, $10,500; Contention, 25, $10,687; Standard, 28, $7,120; Bonanza King, Aug. 2, $12,532; Bodie, 5, $1,755; Navajo, 4, $10,000.

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After the first of April, 1884, we announced a reduction of the price of the MINING AND SCIENTIFIC PRESS from $4 to $3 a year to all who would settle up arrearages at old rates and pay *in advance* thereafter. There are some who have not yet taken advantage of this offer, and we would therefore urge all subscribers still in arrears to remit what is due us to this date, at the rate of $4 a year, and pay in advance for another term at the reduced rates for new subscriptions paid in advance.

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Alaska M Co	California	5	1.50	June 23	July 28	Aug. 14	A. Judson	320 Sansome st
Alpha Con M Co	Nevada	18	50	July 16	Aug 21	Sept 10	W Willis	309 Montgomery st
Alaska M and M Co	Alaska	7	1.00	July 22	Aug 26	Sept 16	E F Stone	306 Pine st
Boracic Acid M Co	California	3	05	July 21	Aug 25	Sept 15	H C Droger	309 Montgomery st
Bodie Tunnel M Co	California	9	20	June 30	Aug 2	Aug 20	C C Harvey	309 California st
Best & Belcher M Co	Nevada	30	50	July 9	Aug 14	Sept 2	W Willis	309 Montgomery st
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Equitable Tunnel M Co	Utah	30	10	July 29	Sept 15	Oct 7	W A Van Bokkelen	419 California st
Enterprise M Co	California	1	15	July 1	Aug 1	Sept 5	W Van Bokkelen	419 California st
Humboldt Hill M & M Co	California	1	15	July 15	Aug 19	Sept 5	J Stadtfeld	419 California st
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Mono G M Co	California	21	50	July 8	Aug 12	Sept 1	G W Sessions	309 Montgomery st
Morgan M Co	California	11	1.00	July 3	Aug 30	Sept 22	C S Neal	309 Montgomery st
New York Hill M Co	California	8	20	July 29	Sept 2	Sept 25	J B Lightner	527 Clay st
North Peer M Co	Arizona	1	2.00	June 12	July 17	Aug. 11	H Deas	309 Montgomery st
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Pittsburg M Co	California	10	05	July 11	Aug 15	Sept 5	C G Brooks	210 Front st
Potosi M Co	Nevada	16	50	July 29	Sept 2	Sept 23	C L McCoy	309 Montgomery st
Real Del Castillo M Co	Mexico	2	20	June 28	Aug 4	Aug 22	A Judson	320 Sansome st
Rainbow M Co	California	11	15	June 16	July 21	Aug 18	P F Mohrhardt	311 Montgomery st
Summit M Co	California	7	05	July 4	Sept 8	Sept 29	G W Seasions	309 Montgomery st
Santa Anita M Co	California	7	02	July 30	Sept 2	Sept 22	J M Buffington	306 California st
Scorpion S M Co	Nevada	18	10	June 25	Aug 1	Aug 22	G S Spinney	310 Pine st
Utah S M Co	Nevada	45	50	June 19	July 25	Aug 13	G C Pratt	308 Montgomery st
Valapara M Co	Mexico	2	20	June 28	Aug 4	Aug 22	A Judson	320 Sansome st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Alta S M Co	Nevada	W H Watson	302 Montgomery st	Annual	Aug 21
Columbus Con M Co	Nevada	J M Buffington	309 Montgomery st	Annual	Aug 12
Con Pacific M Co	Nevada	F E Luty	330 Pine st	Annual	Aug 16
Independence M Co	California	J W Pew	310 Pine st	Annual	Aug18
Liberty Hill Co	California	A Adler	309 Montgomery st	Annual	Aug 11
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	Annual	Aug 21
Navajo M Co	Nevada	J W Pew	310 Pine st	Annual	Aug.12
Occidental M Co	Nevada	A K Durbrow	309 Montgomery st	Annual	Aug 11
Peabody M Co	Nevada	R D Hopkins	436 Montgomery st	Annual	Aug 19
South Feather W & M Co	California	A Halsey	328 Montgomery st	Annual	Aug 11

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	May 15
Bodie Con M Co	California	G W Sessions	309 Montgomery st	50	June 5
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	May 27
Idaho M Co	California			4.00	Apr 2
Jacksou M Co	California	D C Bates	309 Montgomery st	10	Mar 16
Kentuck M Co	Nevada	A W Pew	310 Pine st	10	July 21
Paradise Valley M Co	Nevada	W Letts Oliver	325 Montgomery st	10	Apr 28
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Mar 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Apr 2

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 17.		WEEK ENDING July 24.		WEEK ENDING July 31.		WEEK ENDING Aug. 7.	
Alpha	1.10	1.65	.85	1.45	1.15	1.60	.90	1.10
Alta	2.05	3.45	2.60	3.10	2.20	2.90	1.75	2.35
Andes	.45	.70	.40	.45	.40	.45	.30	.40
Argenta						.10		
Belcher	.95	1.50	.95	1.15	.90	1.25	.95	1.15
Belding								
Best & Belcher	2.15	3.50	2.15	2.90	2.30	3.65	2.15	3.05
Bullion	.65	1.20	.65	.95	.70	.90	.60	.70
Bonanza King								
Bone Isle	.35	.65	.55	.50	.50	.50		.60
Bodie Con	.35	2.10	1.50	1.70	1.50	2.20	1.70	2.25
Benton	.45	.75	.50	.70	.40	.45	.30	.40
Bodie Tunnel								
Bulwer	.35	.50			.45	.70		.60
California	.20	.45		.30	.25	.35	.10	.25
Challenge		.25	.20	.25	.20	.30		
Champion				.10				
Chollar	3.15	4.75	3.70	5	2.70	5.00	2.50	3.40
Confidence	1.00	1.75		1.50	1.15	1.30		
Con. Imperial		.10				.10		
Con. Virginia	.30	.50	.30	.35	.35	.50	.25	.35
Con. Pacific	.40	.45		.45	.45	.50		.25
Crown Point	1.40	2.60	1.30	1.50	1.35	1.75	1.35	1.50
Day								
Eureka Con	2.00	2.50		2.50	2.60	2.75		2 10
Eureka Tunnel						.50		
Exchequer	.35	.50	.30	.45	.35	.45		.35
Grand Prize	.35	.40	.30	.40		.35	.50	
Gould & Curry	1.65	2.55	1.75	2.45	2.20	3.70	2.00	3.10
Goodshaw								
Hale & Norcross	4.20	6	4.75	7.00	3.90	8.00	2.95	4.60
Holmes								
Independence				.30		.25		.25
Julia								
Justice	.25	.55	.30	.35	.25	.30	.10	.30
Martin White						.25		
Mono	.35	.40	.20	.35	.25	.30	.95	.30
Mexican	1.00	2.65	1.95	2.60	2.30	3.15	1.8	2.45
Mt. Diablo		2.00						
Northern Belle								
Navajo	3.75	4.10	4.10	4.20	4.00	4.25	3.80	3.90
North Belle Isle				.20				
Occidental	1.35	1.70	1.40	1.50	1.40	1.40		1.25
Ophir	1.10	2.25	1.55	1.80	1.55	2.35	1.25	1.90
Overman	.25	.40	.20	.25	.25	.30	.20	.25
Potosi	1.50	2.30	1.80	2.50	1.45	2.75	1.25	1.75
Pinal Con								
Savage	1.15	1.70	1.30	1.95	1.35	2.40	.90	1.45
Seg. Belcher						2.00		
Sierra Nevada	1.50	2.50	1.60	2.00	1.60	3.05	2.00	2.65
Silver Hill		.10		.10		.10		.10
Silver King			4.75	5.00		4 95		
Scorpion	.20	.40	.20	.25	.25	.50	.30	.40
Syndicate	.45	.50	.45	.50	.45	.50		
Tioga								
Union Con	.35	2.40	1.70	1.90	1.75	2.70	1.65	2.15
Uta	.60	1.85	1.00	2.00	1.70	2.65	1.40	2.00
Yellow Jacket	2.35	2.75	2.00	2.25	2.10	2.60	2.05	2 20

Sales at San Francisco Stock Exchange

THURSDAY A. M., Aug. 7.		AFTERNOON SESSION.	
450 Alta	2.10@1.15	550 Alta	1.95@2
200 Alpha	1.25@1.30	380 Alpha	1.00@1.05
50 Bodie Con	2.00	400 B. & Belcher	2.20@2.25
100 B. & Belcher	2.10@2.15	50 Bullion	55c
500 Benton	40c	50 Bodie	1.90
250 Chollar	3@3.10	500 Benton Con	40c
150 Con. Pacific	50c	90 Belle Isle	55@60c
50 Eureka Con	2.50	200 Crown Point	1.40@1.45
500 Gould & Curry	2.25@2.30	550 Con. Virginia	25@30c
1150 Grand Prize	70@75c	820 Chollar	2.90@3.00
1190 Hale & Nor	2.75@2.90	200 California	10c
150 Mexican	2.20	110 Gould & Curry	2.30@2.35
600 Mono	10c	1770 Hale & Nor	2.65@2.75
600 Navajo	3.80	250 Mexican	2.15@2.20
150 Ophir	1.45	300 Mono	05c
25 Occidental	1.15	515 Ophir	1.45@1.50
250 Potosi	1.55	100 Overman	20c
1000 Savage	1.00	400 Sierra Nevada	2.45@2.50
250 Sierra Nevada	2.40@2.45	170 Savage	95c
100 Scorpion	40c	30 Silver King	4.50
100 Syndicate	40c	550 Syndicate	40c
100 Silver King	4 50	250 Scorpion	35c
10 Seg. Belcher	13	260 Union	1.95@2.00
200 Union	1.95@2.00	120 Yellow Jacket	2.05@2.10
120 Yellow Jacket	2.05@2.10		

THE National Rifle Association has sent the Governor of each State and Territory a circular, requesting that he contribute a prize to be competed for at the annual fall meeting at Creedmoor, and to be known as the "Governors' match," each prize to be named after the Governor preseuting it for competition.

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, August 7, 1884.

ANTIMONY—Per pound		14 @	15
BORAX—Per Pound (extra)		16 @	—
IRON Glengarnockton	25 00 @		—
Eglinton, ton	24 00 @		—
American Soft, ton	27 00 @		—
Oregon Pig, ton		@	—
Clipper Gap, Nos. 1 to 4	30 00 @	32 00	
Clay Lane White	23 00 @		—
Shotts, No. 1	28 00 @		—
Refined Bar		3½@	3
Boiler, 1 to 4	5 00 @	5 50	
Plate, 5 to 10		4½@	4¾
Nail Rod		7½@	—
Norway, according to thickness		6½@	7¾
STEEL—English Cast, lb		14 @	15
Black Diamond, ordinary sizes		14 @	25
Drill		15 @	—
Machinery		12 @	14
COPPER—Ingot		22 @	—
Brazers' sizes		32 @	—
Fire-box sheets		28 @	—
Bolt		25 @	28
Old		12½@	15
Bar		— @	—
Cement, 100 lbs		12 @	—
Copper in New York, Aug. 5		13⅝@	14¼
LEAD—Pig		4½@	—
Bar		5½@	6
Pipe		7 @	—
Sheet		8 @	—
Shot, discount 10 % on 500 bags: Drop, ⅞ bag		2 00 @	—
Buck, ⅞ bag		2 20 @	—
Chilled, do		2 40 @	—
TIN PLATES—Charcoal		6 00 @	6 50
Coke		6 00 @	—
Banca tin		22 @	23
I. C. Charcoal Roofing, 14x20		6 25 @	6 50
ZINC—By the cask		10 @	—
Sheet, 7x3-ft, 7 to 10 lb, less the cask		9 @	10
NAILS—Assorted sizes		3 25 @	—
QUICKSILVER—By the flask		30 00 @	—
Flasks, new		1 05 @	—
Flasks, old		85 @	—

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

Mining and Scientific Press.

LEADING MINING JOURNAL OF THE WORLD.

Established in 1860, this Journal has been eminently successful as a popular and useful mining and mechanical journal. Relative to precious metals especially, it is the leading mining paper of the world.

It is largely patronized by the leading Miners, Mine Owners, Superintendents, Engineers, Metallurgists, Chemists, Manufacturers, Mechanics, Scientific, Professional and Industrial "Men of Progress" on the Pacific Coast, and many leading Mining Men throughout the mining fields of the world.

It is by far the best advertising medium in the Pacific States and Territories for Mining, Mechanical, Engineering Building and Manufacturing Tools and Implements, Goods, Supplies, etc.

Being thoroughly able and reliable in its editorial and business management, and long established in the most progressive industrial portion of the Union, at present, its power as an advertising medium is unsurpassed.

Subscription, $3 a year. Advertising rates, moderate. Send for samples and further information.

DEWEY & CO., Publishers,
252 Market Street, San Francisco

To Subscribers.

While our paper is, generally speaking, very prosperous, the publishers find themselves more than usually in need of money at this time, as our expenditures are constantly large. Those who have been waiting for busy times, or for other reasons, before renewing subscriptions and making payments to this office, are now kindly urged to favor us at as early a date as possible. Also, please remember that it is a good season to suggest to others that they, too, profit by subscribing. We hope to hear from many within the next few weeks, from all along the line of our large subscription list of intelligent and appreciative readers.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First street, a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below costs, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. References as to above can be had upon applying to this office.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

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Importers and Dealers in all kinds of
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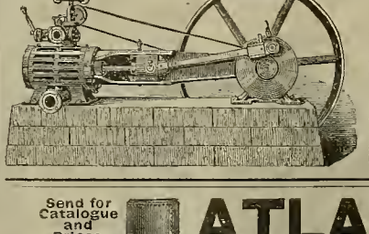
PIG IRON, ENGLISH FOUNDRY COKE, CUMBERLAND & LEHIGH COAL
SPECIALTIES.



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Heavy Automatic and Slide-valve Engines.
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....SOLE AGENTS FOR THE....
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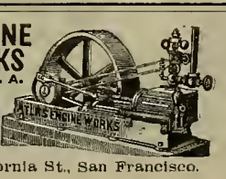


H. P. GREGORY & CO., Sole Agents, 7 and 4 California St., San Francisco.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.]

FOR WEEK ENDING JULY 29, 1884.

302,021.—CHIMNEY—L. L. Clawson, S. F.
302,025.—ORE ROASTING FURNACE—M. B. Dodge, S. F.
302,828.—CABLE GRIP—Dods & Hindes, Va. City, Nev.
302,833.—REVERSIBLE PLOW—W. H. Foye, S. F.
302,843.—FORCE PUMP—L. Herbert, Hicksville, Cal.
302,850.—ACID FEEDER FOR SODA WATER APPARATUS—Thos. Kendall, S. F.
302,851.—ESCAPEMENT—A. W. Kientoff, Dallas, Or.
302,852.—SHIRT—L. Lemos, S. F.
302,576.—TRACK CLEARER—Thos. S. Manning, S. F.
302,766.—SAW SHARPENING MACHINE—Thos. O'Connor, S. F.
302,630.—STEAM ENGINE.—J. B. Pichlord, S. F.

Patents Allowed.

Among patents recently allowed, and not yet announced, we are at liberty to mention the following which will soon issue:

TWO WHEELED CART—F. A. Knox, Woodland.
DENTAL TOOL—Grace & Miller, S. F.
SAFETY CAR TRACK—J. Denechaud, S. F.
MOP AND BRUSH—W. J. Mills, Oakland.
PLOW—A. H. Fitch, Santa Cruz.
MILL STONE IRONS—Geo. Summerton, S. F.
GRAIN SCOURER—J. C. Hunt, Chico.
HORSE SHOE NAIL—J. C. Simpson, S. F.
WHIP SOCKET, OIL CAN AND WRENCH—C. L. Bard, San Buenaventura.
WINDMILL—Saunders & Bentley, San Jose.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

WAGON BRAKE. T. J. Sparks, assignor of one-half to Robt. McDonald, both of Oroville, Butte Co. No. 302,359. Dated July 22, 1884. This new brake for wagons, consists in straps applied to the upper semi-circumference of the wheels, one end of the straps being secured to a transverse beam or bar under the wagon bed, and the other attached to cranks on a rock shaft at the back of the wagon, by which means they are tightened down on the wheels to brake them, or lowered to relieve them.

BALING PRESS.—Jacob Price, San Leandro. No. 302,355. Dated July 22, 1884. It consists of an upright press, the bale being formed in a chamber at the top by a succession of charges which enter through an inclined feed-throat or hopper at the bottom of the press, into which the material to be baled is placed, and the hopper closed after each charge is received, until it has been forced into the baling chamber by a vertically-moving follower. It also consists in a mechanism for operating the follower, an eccentric of variable power by which this mechanism may be operated, retainers by which each charge is held in place while the follower descends for a new charge, and the means by which the horse-power lever may be disconnected from the mechanism by which the follower is moved, so that the latter may descend without stopping the horse or changing the direction of his movements.

REVOLVING ORE-ROASTING FURNACE.—Miles B. Dodge, S. F. No. 302,025. Dated July 29, 1884. This is one of that class of furnaces in which the body of the furnace is rotated during the process of roasting. The invention consists of a roasting chamber, having its interior composed of parallel surfaces extending from end to end, provided with flanges, and means for revolving the chamber, combined with a fire-box, a dust-chamber and chimney.

SAW TOOTH. John J. Bowen, S. F. No. 302,317. Dated July 22, 1884. The invention relates to improvements in saw plates, into which independent teeth or cutting bits and bit holders are inserted, and it consists of a supplemental segment fitted with a correspondingly curved and grooved recess in the saw plate, where it is held by a rivet or suitable device, said segment having its front adapted to receive the rear portion of the bit and bit holder, and operating as an intermediate holder between them and the saw plate itself.

GRAPE CRUSHER AND STEMMER.—Pierre Sainsovan, San Jose, Cal., No. 301,629. Dated July 8, 1884. This machine for crushing grapes and removing the stems consists in two novel revolving crushing rollers, an underlying vibrating sieve, and an intervening alternately-acting series of reciprocating rakes operating over the sieve; and it consists in the mechanism by which the parts have imparted to them their proper motions, and in certain details of construction. The object is to provide a simple and effective stemmer.

SIDE HILL PLOW. Ira B. Kilgore, San Jose, No. 305,341. Dated July 22, 1884. This invention relates to that class of plows in which the plow bottom is pivoted and is adapted to swing on a longitudinal horizontal line from one side of the standard to the other, to adapt it for use on hillsides. The invention consists of a novel pivot connection between the plow-bottom (the combined share and mold-board), and the land-side, as a means for securing said plow-bottom when adjusted in place, in a novel combined double standard and land-side, and in a novel point of connection between the handles and the standard.

ONE OUT OF A HUNDRED HEARD FROM.—C. Muller, 135 Montgomery street, desires to inform our readers that he is not the optician interviewed by the *Chronicle* reporter, issue of February 12th, as he does not claim as his own, nor require Berringer's Patent Optometer, Rochester, New York, or any other as his own invention. There are many pretenders and would-be opticians, but very few frank enough to confess it. Some opticians claim exclusive mechanical facilities for suiting the eye, and acknowledging their utter incompetency when pathological difficulties present themselves. No swindling or make-believe pretensions resorted to at my establishment. Physical and Physiological Optics are my daily study. With over thirty years practical experience, I can confidently solicit all who have eye difficulties to avail themselves of my professional service free of charge. C. MULLER, Optician, 135 Montgomery street, San Francisco. 1

Scientific, Mining and Other Valuable Books.

PUBLISHED OR SOLD, WHOLESALE AND RETAIL, BY DEWEY & CO., MINING AND SCIENTIFIC PRESS BUILDING, S. F.

BY GUIDO KUSTEL,

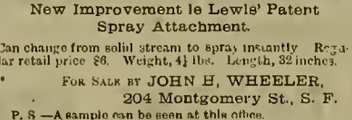
MINING ENGINEER AND METALLURGIST.

CONCENTRATION OF ORES (of all kinds), including the Chlorination Process for Gold-bearing Sulphurets, Arsenurets, and Gold and Silver Ores generally, with 120 Lithographic Diagrams. 1887.

This work is unequaled by any other published embracing the subjects treated. Its authority is highly esteemed and regarded by its readers; containing, as it does, much essential information to the Miner, Millman, Metallurgist, and other professional workers in ores and minerals, which cannot be found elsewhere in print. It also abounds throughout with facts and instructions rendered valuable by being clearly rendered together and in single order. It contains 120 diagrams, illustrating machinery, etc., which alone are of the greatest value. PRICE, $7.50.

ROASTING OF GOLD AND SILVER ORES (Second Edition) and the EXTRACTION of their Respective Metals without Quicksilver. 1880.

This rare book on the treatment of gold and silver ore, without quicksilver, is liberally illustrated and crammed full of facts. It gives short and concise description of various processes and apparatus employed in this country and in Europe, and the why and wherefore. It contains 156 pages, embracing illustrations of furnaces, supplements and working apparatus. It is a work of great merit, by an author whose reputation is unsurpassed in his specialty. PRICE, $3, coin, postage free.



Is the Best Pump in the World. Another New Improvement le Lewis' Patent Spray Attachment.

Can change from solid stream to spray instantly. Regular retail price $6. Weight, 4½ lbs. Length, 32 inches.

FOR SALE BY JOHN H. WHEELER,
204 Montgomery St., S. F.

P. S.—A sample can be seen at this office.

SURVEYORS—INVENTORS.

A. SCHURCH, Mathematical Instrument and Model Maker, 335 Bush street, S. F. Scientific Apparatus and Experimental Machinery at short notice.

THE EMBREY CONCENTRATOR.

Having sold my interest in the EMBREY CONCENTRATOR to the Frue Vanning Company, I offer for sale at cost a few I have on hand to close the business.

STEPHEN P. M. TASKER,
Fifth and Tasker Sts., PHILADELPHIA, PA.

ASSESSMENT NOTICE.

Gould & Curry Silver Mining Company.

ASSESSMENT No. 48.

Levied	June 1884
Delinquent	July 11, 1884.
Day of sale	August 4, 1884.
Amount	Fifty cents per share.

ALFRED K. DURBROW, Secretary.

OFFICE—Room No. 69, Nevada Block, No. 300 Montgomery street, San Francisco, Cal.

San Francisco Cordage Factory.

Established 1856.

Constantly on hand a full assortment of Manila Rope, Sisa Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.

Extra sizes and lengths made to order on short notice.

TUBBS & CO.
611 and 613 Front St., San Francisco.

FOR SALE.

COPPER WORLD MINE,

Consisting of Three Full Locations.

J. A. BIDWELL,
Ivanpah, Cal.

VENTILATED

Rubber Boot

WILL NOT SWEAT THE FEET.

....WILL....

Keep the Feet Warm and Dry.

Warranted to satisfy in all cases. "Have proved the best rubber boot I have ever worn. They do not sweat or tire the feet."—Dr. W. L. McCleary, Washington, Pa. Hip Boots sent C. O. D., $6 50.

ALLEN, Agent for Pacific Coast.
416 Market St., San Francisco.

ELECTRIC AMALGAM.

$2 per pound, $1 per half pound Trial Bottle, Post Paid.

SEND FOR TRIAL LOT and CIRCULARS.

THIS IS AN ABSOLUTE STORAGE OF ELECTRICITY,

Saving Gold, Keeping Plates Bright, Soft, and Clean, Prevents Flowering and Sicking of Quicksilver.

UNITED STATES ASSAY OFFICE, 30 WALL ST.

NEW YORK, July 9, 1884.

Electric Amalgam Company—GENTLEMEN: We have analyzed a sample of your Sodium [Electric] Amalgam, which gave 2½ per cent of Sodium. We have used 10 parts of common quicksilver on a small quantity of free gold ore, and extracted 5 ounces per ton. By use of 8 parts of common quicksilver and 2 parts of your Amalgam, extracted at the ratio of 36 ounces per ton. Yours respectfully, (Signed) TORREY & EATON.

DR. J. H. RAE, Agent, 7 Exchange Place, Boston, Mass.

ECLIPSE DOUBLE TURBINE WATER WHEEL.

Points of Superiority:

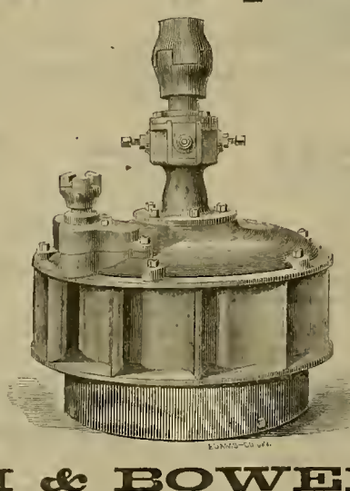
FIRST.—Simplicity, being composed of the smallest possible number of parts.

SECOND.—The Wheel, Outer Case, Register Gate, and Top, each being one casting, and all the work on them being performed by machinery, and fitted to a standard gauge, secures the highest perfection in construction and operation, and the utmost strength.

THIRD.—The entire absence of rods, bolts, levers, light castings, or "traps" of any kind, securing the greatest durability, with entire immunity from derangement of parts and breakage, so common in all complicated wheels.

FOURTH.—The conical interior of the wheel, which secures perfect freedom of vent for both tiers of buckets, enabling the wheel to rid itself immediately of "dead water" without friction. This feature is entirely original with this wheel, and is found to be of very great practical importance.

FIFTH.—Its "Duplex Chute," formed by the Register Gate and outer case. The outer case moulds the current of water, delivering it in a solid body through that part of the Chute comprised in the Register Gate on to the wheel. This Chute being fixed, the direction of the



current is never changed, nor its velocity checked, consequently nearly the same per cent. of power is obtained with the gates only partially drawn as when fully open.

SIXTH.—A Gate thoroughly protected from vertical pressure, which, when partially closed, does not break the column of water or change its proper direction, which is easily operated, and yet shuts so tight as to prevent leakage; and the shutting of which is not likely to become obstructed or prevented by foreign substances.

SEVENTH.—The housing up of the pinion and segment for operating the gate, which entirely prevents all danger of breakage by foreign substances getting between the teeth. No other concern does or can use this improvement, which effectually does away with a source of most frequent annoyance and delay.

EIGHTH.—The amount of power it yields, together with its Simplicity, Durability and Strength, fairly entitles our wheel to the name given it, The Eclipse Turbine. In further proof of the power of this wheel, we invite a careful inspection and comparison of our tables with corresponding tables for all other similar wheels.

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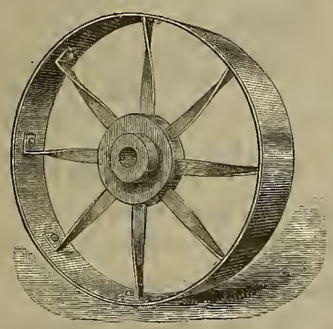

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They are less than half the weight of cast-iron pulleys; are polished on the face; are made either crowned or straight, and are turned in the lathe the same as the best make of cast-iron pulleys.
They are carefully balanced. They are subject to no contraction strains, and can be run at very high speed without danger of bursting.
On account of their great lightness and the form of the arms, they absorb less power than any other pulley.
They are *the only pulley of the kind* which runs true. They cannot be broken in transport.

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N. Macbeth, Esq. —Dear Sir: The Patent Steel Pulleys supplied throughout to our No. 2 Mill are working to our entire satisfaction.
They are very true, and are about 50 per cent lighter than the cast-iron pulleys in our No. 1 mill.
Yours faithfully,
For the Mather Lane Spinning Co. (Limited),
[Signed:] RICHARD T. MARSH, Managing Director.

Risdon Iron & Locomotive Works,
Sole Manufacturers and Agents for the Pacific Coast,
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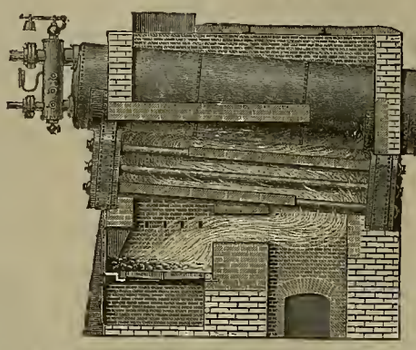

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Messrs. Adolphus Meier & Co. GENTLEMEN: We cheerfully certify that the "*Heine Patent Safety Boiler*" put up by you in our establishment has proved very satisfactory in its working. The chief points of excellence in the "Heine Safety Boiler" are its economy in fuel and space, freedom from scaling, aptitude for power and heating purposes, working equally well with clear and muddy water. We warmly recommend it to all using steam machinery. Yours truly,
ANHEUSER-BUSCH BREWING ASS'N.

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(Signed): BRAUCKE.

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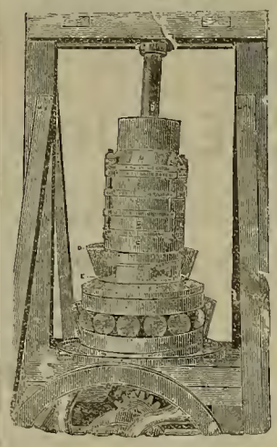

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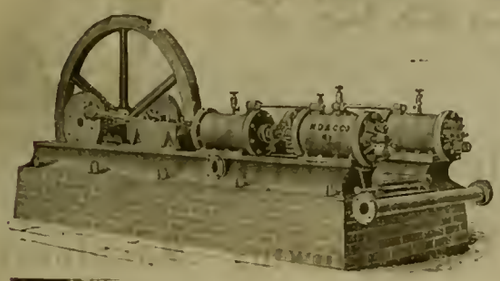

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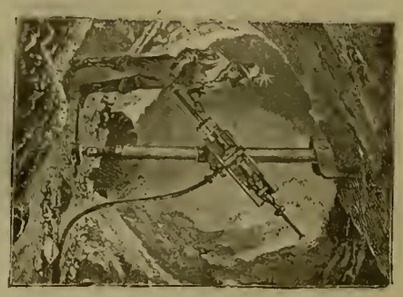

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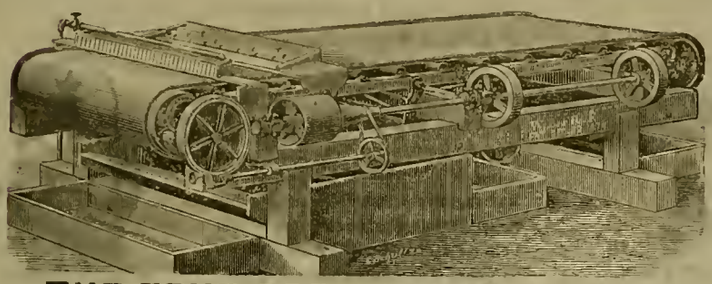

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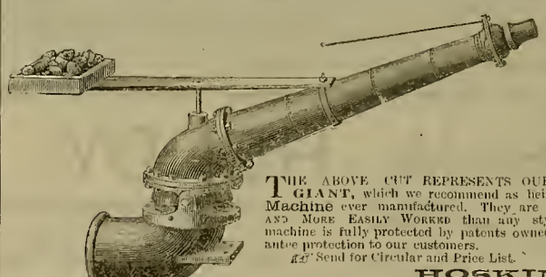

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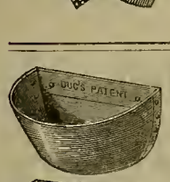

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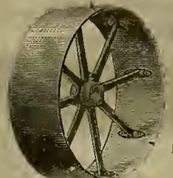

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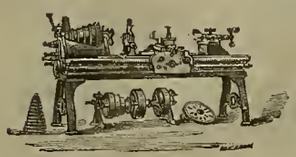

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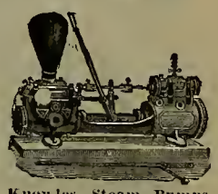

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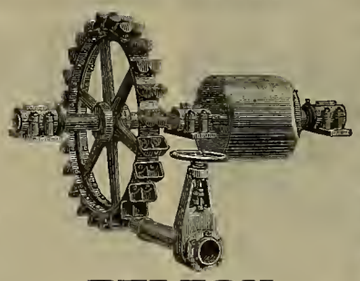

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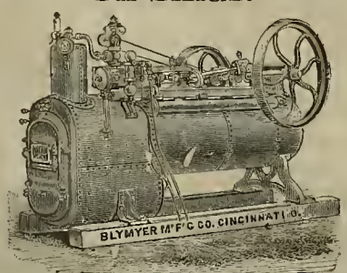

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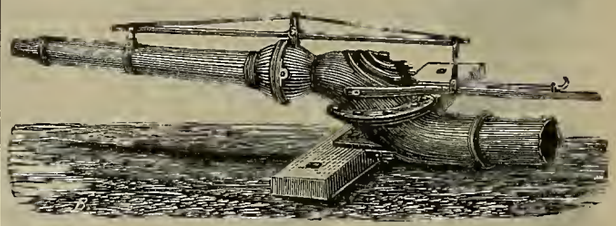
IMPROVED FORM OF
HYDRAULIC GIANTS.



SOLE MANUFACTURERS OF
HYDRAULIC GRAVEL ELEVATORS.
Hydraulic Mining Machinery of every Description.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

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New Rock Pulverizer.

William Corcoran, of this city, has patented through the MINING AND SCIENTIFIC PRESS Patent Agency, a crusher and pulverizer of novel form. There is an exterior case, in which a hollow cylinder or drum rotates on a shaft. Another cylinder lies inside the drum or cylinder, so low that its outer periphery comes in close proximity with the inner periphery of the drum at its lowest point. This inner cylinder is supported on a separate shaft, which projects through the opposite side of the case from that which revolves the drum. The inner cylinder has bars, driven diagonally across the face in dovetailed slots, by which they are firmly held so that their outer faces project above the face of the cylinder. The inner surface of the outer drum has similar bars in dovetailed slots, and in the opposite direction from the angle of the bars in the inner cylinder, so that when the two rotate in opposite directions there will be a shear-like action between these bars and shoes.

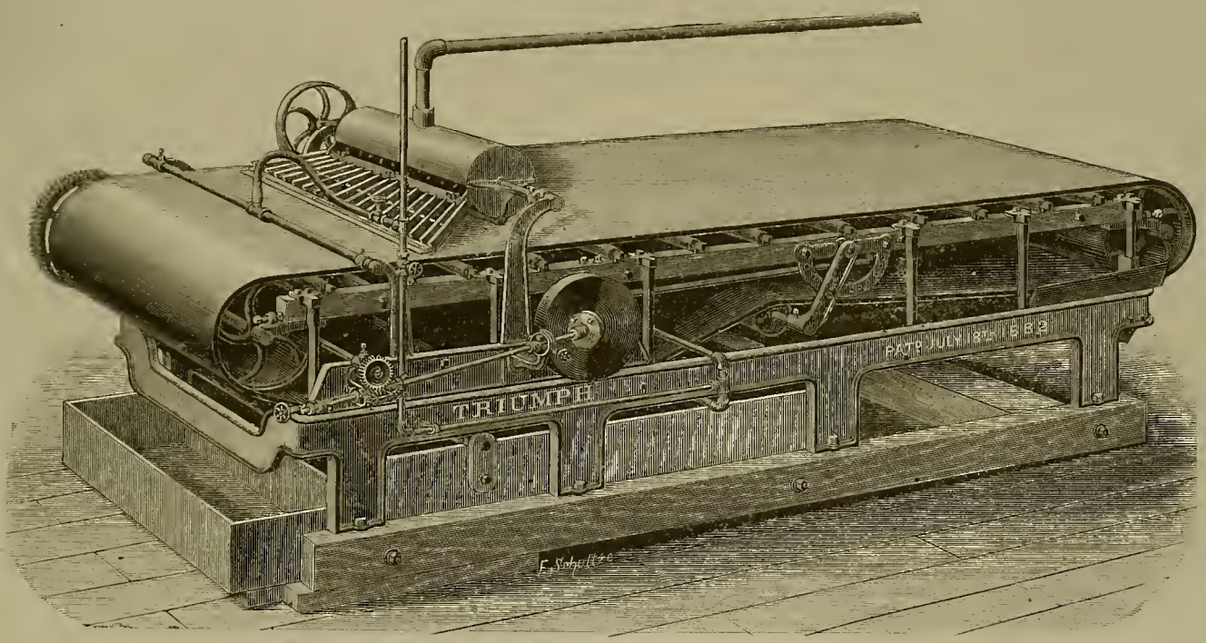
In order that the shaft of the inner cylinder may drive it, and at the same time allow the cylinder to adjust itself to the varying quantities of rock that may be beneath it, an oval hub is keyed to the end of the shaft, so as to fit loosely within a large oval opening in the center of the cylinder. When the shaft is turned the hub presses against the sides of the opening, and thus drives the cylinder. The rock or ore is fed in so as to fall through between the two cylinders, which rotate in opposite directions, and soon pulverize it to sufficient fineness, and it is carried up and discharged through a pipe through the action of a suction fan. When the diagonal bars or shoes become worn, the case is removed, cylinders taken out, and the bars or shoes driven out from opposite sides. As these bars receive most of the wear, it is only necessary to replace them to have the machine again in good working order.

The peculiar movement of these oppositely moving, diagonally placed bars or shoes is to produce a shearing action on the material passing between them, and it is thus rapidly reduced. Whenever these bars become worn on one edge, the machine is run in the opposite direction, the position of the discharge-pipe being changed to correspond, when the opposite edges of the bars take the wear. The drum settles and adjusts itself to the wear as fast as it takes place.

"Triumph" Ore Concentrators.

On this page is an illustration of the new and improved form of the "Triumph" Ore Concentrator, as now constructed by the Joshua Hendy Machine Works, No. 39 to 51, Fremont street, this city.

A competitive trial between this machine and the Frue was lately made at the mill of the Original Empire M. and M. Company, the celebrated gold producing mining property in Grass Valley, Nevada county, this State, under the personal supervision of the manager and superintendent of that



THE "TRIUMPH" ORE CONCENTRATOR, WITH LATE IMPROVEMENTS.

valuable estate. The facts and figures which are herewith given are compiled from reports furnished by David McKay, Jr., Esq., the Superintendent, and are therefore authentic.

"This competitive test was made between two of the 'Triumph' concentrators, and an equal number of 'Frue' vanners; each taking respectively an equal delivery of the ore pulp from two adjoining batteries, of five stamps each; the four machines being placed in pairs, side by side, and pulp troughs and pipes being so arranged that perfectly uniform distribution of all of the pulp passing from the aprons of the two mortars was maintained over the four concentrators. The run continued unintermittingly during a period of twenty-four consecutive days of twenty-four hours each, with these conclusions.

"Four hundred and fifty tons of ore were crushed under the stamps of the two batteries, the pulp of which, after passing over silver plated copper plates, was equally distributed to the four concentrators on trial and the following results were obtained:

"The 'Triumph' concentrators produced 21,159 pounds of concentrates, which yielded, after deducting the cost of chlorination, $1,713.22 net, while the 'Frue' vanners yielded 18,180 pounds of concentrates, of a net coin value, after deducting cost of chlorination, of $1,514 07, showing a gain in U. S. gold coin of $199 15 in favor of the 'Triumph' in the value of concentrations; to which is still further to be added the waste amalgam saved after passing the plates, and retained in the feed-bowls of the 'Triumphs,' which amounted to 40 ounces, of a coin value of $4 50 per ounce, or equivalent to $180, which is properly to be placed to the credit of those machines, as none was saved by the 'Frue' vanners."

"We therefore have as the net resultant gain of the 'Triumph' over the 'Frue' value, of concentrations, $199 15 amalgam and $180 = $379 15, or a net saving of $15 80 per day for the two 'Triumphs,' which sum will reimburse their cost price in, say, two months of use—in other words, a saving of $1 70 per ton for each ton of ore treated during the run."

We deem it to be pertinent to present the above facts and figures to the mining public, for the discovery of the best methods and devices for the perfect concentration of the valuable metallic particles existing in gold, silver, galena and other ores, has long engaged the earnest and assiduous attention of scientists, chemists, metallurgists, millmen and others, and the machine or device, be it called concentrator or vanner, which will produce, under equivalent conditions of operation, a more perfect concentration of the valuable metallic elements of ores, and a consequent increased yield of the precious metals of commerce, is entitled to a distinguished rank in the long line of concentrating machines which have been devised, constructed and operated. And as "competition is the life of trade," we invite, at the suggestion of the manufacturers, the attention of the mining public to the practical operation of one of the "Triumph" concentrators at the Joshua Hendy Machine Works, Nos. 39 to 51 Fremont street, this city. The machine shown in the cut has all the late improvements, which make it much more effective than was the original concentrator.

The African Hydraulic Mines.

Advices were received here recently to the effect that the much landed gravel mines in the Transvaal, had proved to be failures. It will be recollected that some months ago there was a great stir made here on the subject, and a large lot of expensive machinery was purchased in this city and sent by rail to New York and thence to the gold fields. California men were selected to work the mines also. In England heavy companies were formed to purchase and work the mines, and it was thought a second California field of gravel mines had been found. It turns out now, however, that the prospects are by no means bright of the stockholders getting their money back, much less any profit on the transaction concerning the fields. The *London Mining Journal* has this to say: "The Transvaal Gold Fields have always been most cautiously referred to in the *Mining Journal* in answer to inquiries made. It has been asserted that gold is very widely disseminated in various parts of the country, but that there are very few facilities for working, and no deposits which are at all likely to pay dividends to share-holders in companies with heavily loaded capital accounts. A correspondent referring to the subject says—'Reports from the gold fields are not quite of so rosy a hue as some of the projectors of the huge bubbles would like to read.' I see it reported that 'Professor Heddle's report on Lisbon-Berlyn will not be so satisfactory as the directors could wish.' It is expected (says the *Cape Argus*) 'the professor will demonstrate that the expenditure is far too high ever to allow of a dividend being paid.' Well, people with common sense and any knowledge of gold mining demonstrated long ago that huge enterprises of the Emma pattern under such expensive and ornamental management would never pay. The system of inaugurating gold mining companies after the style of the Balkis and Lisbon-Berlyn and others of that style must as a natural consequence come to grief—a big list of high sounding names as directors and managers. Shareholders, &c., will not pay dividends out of poor ground. Then what becomes of the exaggerated reports of the value of the ground were these reports written to order to suit the oily tongued promoters to deceive the susceptible public, who subscribed for shares on the faith of them and the respectable names on the directory."

English vs. American Policy.

England, despairing of holding her own in the cotton markets of the world, is resorting to the desperate policy of transferring a large portion of that industry to India, where she hopes to utilize the cheap labor of her two hundred and fifty millions of serfs, who are glad to give a day's work for ten cents and count fifteen hours to the day. Although this movement is only in its infancy, still her capitalists have already upwards of seventy cotton factories now in operation there, with about 19,000 looms.

This experiment is a most dangerous and demoralizing one, as is already becoming apparent to the intelligent and thoughtful English statesman. England originally planted herself in India with the expectation of founding there, or rather of building up in that region, a large market for her home productions, and incidentally securing the control of certain products, under her own rule, for which she would otherwise have to depend upon foreign and more or less hostile nations. But scarcely have the people of that region been educated up to see and feel the ordinary wants of civilization before her capitalists engage in the work of putting into the minds and hands of those people the intelligence, skill and tools to supply themselves with their new-found needs. England did not do so with her American colonies. Perhaps they taught her a lesson in that direction which she does not care to have repeated. The policy may be all right, ethically considered, but its damaging effect upon the English people will be all the same, and its demoralizing tendency upon the masses will be none the less for the moral and civilizing aspect which it assumes.

In fact the movement has already become a disturbing element, not only among the masses at home, but also among the capitalists there who have invested their means with the view of giving employment to their own people and seeking a market for the products of their labor in India. Notwithstanding the consumption of cotton goods is rapidly increasing in India, their importation from Great Britain is falling off. Within the last three years the falling off has been about 10 per cent. And what is still more significant, India is already entering foreign markets with her manufactures in direct competition with the United Kingdom. Indian statistics show that the importation of piece goods from India to China rose from 15,000,000 yards in 1880 to upwards of 41,000,000 in 1883! Moreover, hitherto the bulk of the Indian trade in general has been largely with the United Kingdom, but now the complaint comes up that that too is falling off. Carefully prepared statistics show that the total amount of decrease in this direction from 1877 to 1882 reaches within a small fraction of 10 per cent!

The fact elsewhere noted in these columns, that of the 40,000,000 spindles which represent the cotton manufacturing industry of this date in England, at least 20,000,000 are running at a loss, 2,000,000 are idle, and only eight out of the 18,000,000 remaining are holding their own, speaks volumes to the thoughtful statesman as to what the near future may bring forth.

And it is not in the cotton industry alone that India looms up as a future rival to the home Government. She shows very nearly a similar development in the jute fabric; also in the manufacture of boots and shoes. Coal, iron, steel, paper and leather are also being produced. Raw cotton is also being largely produced there, while her production of wheat is getting to be enormous, and has already seriously affected the market for American wheat among the buyers of Europe. In these two latter cases, England may be the gainer, and the United States the loser.

But taking the aggregate, England, by her own act, is brought into direct competition with the cheap labor of India—the cheapest labor in the world. That step is already telling with fearful effect upon her idle, starving masses at home. What will they do about it? But one way seems open to them—emigration to this country, where the true policy of home protection prevails. We have a country large enough and broad enough for all the intelligent, skillful, but down-trodden masses of Europe—large enough to give them all a farm. We have no entangling alliances abroad; but we do not seek either to control or incorporate into our body politic the ignorant, half civilized people, who may be found either upon our outlying borders, or in more distant regions. We are willing to extend to all such, a kindly, helping hand. We would do what we reasonably can to raise them to the level of civilized humanity, and look for our reward simply in the satisfaction of serving a neighbor and accepting the incidental and greater benefit that would naturally accrue from contact with an industrious and civilized people, over a half civilized, ignorant and idle people.

We have adopted the policy of keeping out from our borders all objectionable classes. We want none but such as can assimilate with us. We have already put up the bars against Asiatic half civilization, and we are now engaged in strengthening them. We have a similar work to do with the ignorant pauper labor of other parts of the world. That work will soon be one. But we welcome with open arms, intelligent and skilled labor, such as comes to us in good faith, to accept our policy of protecting ourselves; to sustain a free and popular form of government, to establish and encourage the family relation and the christian form of marriage. Such people always come with something wherewith to help themselves. They make good citizens, good neighbors, good commonwealth builders. We have room for all such. We bid them welcome—welcome to our broad acres, welcome to our shops, and welcome to all the relations of life and business.

The policy we have adopted is self sustaining. With a land, stretching from the northern Arctic to the southern tropics, we can produce everything we need, and live comfortably and respectably while we produce it, and we don't propose to allow the pauper, or serf labor of outside nations to interfere with our internal relations. We propose to raise our own food, our own raiment, our own luxuries, our own circulating medium, and everything we need or want, and to allow the producer such a fair compensation for his labor, as will enable him, and his family, to live as an intelligent civilized man should live.

We have within our own limits, the best market on earth, and we propose to hold it against all countries. Our people stand unrivalled in education, in mechanical skill, in productive power, and in mercantile aptitude. Our country is without a rival in the variety, or quality of its productiveness. There is no country on the globe, that can come nearer to absolute independence of all others than our own. We can provide our own markets, and when we have a surplus, we have the markets of the world to chose from. Our cereals, our staples, our fruits, our manufactured goods of every class have no superior, anywhere, and our skilled and intelligent labor aided by the best mechanical appliances is, as a general thing, able to cope with the cheap labor, and less skillful appliances of all competitors. When the need comes, we can enter all the great markets of the world.

We now number but 50,000,000 of people; but we have room enough for five or six times that number. And when our present limits are full, and we need more room, we shall know where, and how to get it—the whole boundless continent, may be ours from the northern to the southern Arctic.

Smelting and Concentrating in Butte.

The Butte, Montana, *Miner* says: In the increase of facilities, which has been general at all the reduction works of the camp during the past season, the improvements in the smelting and concentrating works have been notable. The introduction of

Anderson's Concentrator

Has been regarded with great interest by mining men, who have watched its operation with great interest since the arrival of the machinery and its erection in the vicinity of the Longmaid concentrator. Steam was turned on for the first time on Wednesday morning and a very successful trial run was made. It was the first run of the first concentrator ever manufactured of the Anderson patent, but a two hours' trial convinced those interested that the theory and principle of the invention was correct, and that with the surmounting of trivial mechanical difficulties the new concentrator will accomplish the most sanguine expectations of the inventor. A longer run will be made next week, when the *Miner* will give the practical results of an important invention of one of our own citizens, which is expected to produce important changes in the treatment of the low-grade ores of the district. One of the most important

Smelting Enterprises

Which has ever been inaugurated in the camp is the new smelter, calcininer and concentrator now being erected by Messrs. Farrell, Migeon and associates on the Parrott mill site. The capacious buildings for the new works are rapidly nearing completion. The process of reduction to be used by the new works is a French importation, the success of which is said to have been practically demonstrated in France. The calcining furnaces and concentrating jigs will differ but little from those already in operation at local smelters, but the process of reduction through the reverting furnaces is the secret which the patentee and his Johnny Crappo representatives decline to divulge; nevertheless those who are interested in the experiment and are putting up their money to the tune of something in the neighborhood of $150,000 seem to be confident in their belief that the new process will enable them to turn out matte nearly ingot fine, or equal to Chili bars, which are 98 per cent fine. Whether or not this result may be achieved, some of our most experienced operators and heaviest capitalists are interested in the enterprise. They have had their representatives in France for months investigating the matter, and it is altogether probable that their knowledge of the process is such that the erection of the extensive works for treatment of ores is not a mere experiment, and the public may be content to await developments in an enterprise which promises so much for the development of our copper interests.

A MINING COMPANY of Deadwood offers to send to the New Orleans Exposition this fall an exhibit of gold bullion in one solid piece, worth $500,000 providing the various counties of the Territory will unite in defraying the expense of transportation.

The Advantage of the Positive Man.

It has become a well-worn adage that "nothing succeeds like success," but it is not so generally noticed, however, that the next most successful thing is the assumption that the circumstances must be bent and the success must come. It has often been noticed that two men may start upon a business or profession with about equal talents, opportunities, capital and education, and one achieves an unbroken series of successes, while the other fails, and that, too, without any vices or follies that can be made responsible for the failure. This difference of fortune is sometimes called chance, and we hear many people every day bewail their "bad luck," as though they had been wrecked because the winds and waves of an arbitrary predestination were against them. But in the school of a true philosophy there is no such thing as luck. Chance is merely a name for an unexplained cause. No doubt, in many cases this unknown cause may be found in the environments into which a man has been thrown by events over which he had no control, but in the majority of instances it will be found to be an inherent defect of character. Perhaps one of the most common reasons for misfortunes is the lack of self-confidence and a positive force. Of course it will be admitted that an excess of self-esteem is a common infirmity of modern society, and that those who are afflicted with it are exceedingly offensive and disagreeable, but in the struggle of life these distasteful qualities are better than the excessive modesty, the shrinking timidity which tamely consents to be run over and crowded into a corner. It will not be denied that there are many admirable characters who lack nothing to insure their success except a certain snap, nimbleness and pluck-born of a determination to win.

When the angel troubled the waters of the sacred pool, it was the bold invalid who first plunged in who was cured, while the others trembling, hesitating, dallying on the brink, lost the prize. So it is in the affairs of every day life. One cannot always adopt Davy Crockett's admirable motto: "Be sure you are right, then go ahead," for a man must sometimes go ahead feeling his way, casting out the sounding lead. It is certainly desirable to be right, but it is not necessary to take the affidavits of the whole neighborhood before one concludes to venture. It was not the invalid who was reading the advertisements of the cured, that first stepped into the sacred waters. He who lacks the capacity to decide rapidly and accurately what is right, is certain to be rapidly left behind by his more prompt competitors. It is better sometimes to start on the wrong track in a hurry, than to be always behind on the right road.

In dealing with our fellow man, it is interesting to notice the value of being positive. The calm, accurate, logical and unbiased man never exercises the same influence over others possessed by quicker and narrower men. A man who sees only one side of a subject, and who is positive—albeit he may be in error—that he is right, will carry his hearers by his own earnestness to a conviction, which all the logic and argument of his cold, slow-moving, and somewhat indifferent opponent cannot shake. For every dozen who can take in the latter's finished argument, and icy glitter of rhetoric, there will be hundreds who will only weigh the manner of the speaker. Human nature in the man invariably judges others by itself. The lawyer whose personality is not vigorously thrown into his brief, whose faith in the case does not glow in the argument, will be disregarded, while a determined and passionate appeal, uttered as if coming from the speaker's inmost soul, will sweep men's minds irrespective of reason or justice. The doctor who brings no positive assurance of hope to the bedside of the sick, who shows by his doubt and uncertainty that he is beating in the dark, may as well stay away, for he fails to create that confidence that is necessary to the success of the healing art. And so all through life, in many other ways, men who have the best of causes fritter their advantages away, because they trust more to the matter presented than to the manner of presenting it.

QUICKSILVER TRADE.—The exports of quicksilver last month were 1,472 flasks, including 1,000 to New York, now a favorite point of shipment, leaving only 472 flasks for foreign markets, of which Mexico took 369, Japan 100 and British Columbia 3. For the same month last year these exports amounted to only 272 flasks. There has not been a flask sent to Hongkong this year. The Chinese have since been buying altogether in the London market, where they can do better than here. At least, our people do not care to compete with London for that trade. The shipment by water for the first seven months of the year have been as follows:

	Flasks.	Value.
New York	5,950	$150,900
Japan	588	17,032
Australia	10	280
South America	70	2,070
Central America	38	1,064
Mexico	3,344	94,900
British Columbia	22	640
Totals	10,022	$286,805
In 1883	18,539	502,935
In 1882	21,798	638,441

This trade is only one-half what it was two years ago, which is progress in the wrong direction.

Wood River Mines.

From the letter of a correspondent of the Salt Lake *Tribune*, we take the following extracts concerning mining matters at Wood River, Idaho:

The more one becomes familiar with the Wood River country the more he is impressed with the idea that it is a country of wonderful possibilities. Five miles above Hailey, Deer Creek enters Wood River. Deer Creek is a stream of considerable size and is fed by numerous branches, draining the high hills for many miles. About five miles from Hailey we come to the first object of importance in the Bolton Hot Springs, where numerous jets of water having a temperature of about 130 degrees, combine to make up about fifty inches as it flows into the bathing houses, hotels and waste drains.

Mines.

A short distance above the springs, and on the south side is the well known Davitt mine, which was sold last season for $40,000, after which $65,000 was taken out in a short time. The Devitt and Silver King belong to the same company, which operate the two together with a shaft down ninety feet, and being sunk lower. They have good steam hoisting works, buildings and road, and are taking out ore and sending to market.

Above and on the same ledge is the Snow Fly owned by Judge Williams of Ogden and others, together with the Bon Ton, Washington and one other claim. They are taking out and shipping ore and the property is classed as good. Just across the gulch and far up the side is the Mountain View, owned by Fred C. Bradley. Last year he took out and shipped considerable ore, when the pocket became exhausted, but he had faith in its future, went to work, and after a hard winter's toil, the prospect brightens and it will please his many friends to learn that he is about to make a strike again. There are numerous prospects in this locality which give promise of developing well, but unfortunately work is not being done on them. Farther up stream a deep gulch enters from the southeast and is known as the Narrow Gauge. Some two or three years ago, S. D. Connor and John McGregor, two well known Salt Lake men, secured several mining claims here, designated as the Narrow Guage Group, among which were the Narrow Guage No. 1 and 2, the Bannack, and some others.

The Narrow Gauge Group was sold for $80,000 to John V. Farwell, of Chicago, nearly two years ago. He has good mines and is not out in the purchase. A concentrating mill handles twenty tons of crude ore per day. This concentrator was partly carried away by a slide last winter and has just been set to work again. At present twenty men are employed in mining. Last year they took out and sold about 500 tons first-class ore, at an average $148 per ton, it running 63 per cent in lead. Narrow Gauge No. 2 and the Bannack are now being operated. The latter has produced 700 tons of ore. The highest ore assayed from the group 680 ounces silver. The vein is about three feet on the Narrow Gauge. They are driving to tap a ledge found on the surface, and the tunnel is in 550 feet, with a water blast to supply pure air for the men. The ores are chiefly galena, with some carbonate and chlorides.

Passing down Eureka gulch we soon came to the Bay State, being developed by a tunnel by Col. E. A. Wall and which promises well. Farther down we come to the

Chicago Group.

Owned and operated by the two well known Utah miners, Bates and Boyd. The group consists of the Chicago, Parnell, Little Giant and Empire. Four years ago Bates and Boyd landed in Wood River with some capital, and striking these properties, went to work. They have pushed along, among many discouragments, but the amount of work done shows they have not been idle.

This mining district, in fact as a producer of ore leads all others in Wood River so far. There are employed all of 250 men within the district and the town is headquarters for them.

But the most interesting part of Bullion is the mines. At the head of the gulch is the Jay Gould mine and concentrating mill. These have produced well in the past, but are now idle and the property is in financial trouble.

Mayflower.

Next below is the well known Mayflower, first sold for $30,000, then for $375,000, and always a large producer. G. L. Havens is manager of the property, and he knows how to conduct such concerns. As it was on this property the cry that "Wood River mines don't go down" was first started, the following facts are of especial interest:

In 1881 the product of nearly 900 tons averaged 138 ounces silver and 68½ per cent lead.

In 1882 over 1,000 tons of ore averaged 151.90 ounces silver and 66 per cent lead.

Over 1,500 tons of ore in 1883 averaged 176.70 ounces silver and 64 per cent lead.

This season the average so far is 179 ounces silver and 67 per cent lead. Since these facts were learned, a car-load of ore amounting to over 17 tons went 249 ounces silver and 67 per cent lead. The output this year will bring the total for the four years up to fully 10,000 tons of first-class ore marketed, and the bullion product of the country will be indebted to the Mayflower for having added over $2,000,000

MECHANICAL PROGRESS.

Loss of Heat by Steam Pipe Radiation.

Much, says the *Age of Steel*, has been said and written regarding the saving to be made by the proper covering of steam pipes, boilers and other steam surfaces. And while in the main it is agreed, either tacitly or openly, that a saving of steam is made by the proper protection of steam surfaces, yet it is too often looked upon as something which might with propriety be done, but as causing so small a loss by its neglect that the expense of its accomplishment constitutes a somewhat doubtful experiment. Yet the same persons who thus regard this really very important matter, if convinced that by the substitution of a new style of boiler or an improved furnace could in time reap a profitable return, would not hesitate to incur the necessary expense.

With a view of ascertaining facts from authoritative sources regarding this matter we have procured a copy of a report of tests made, in which the covering used was Toope's patent covering, one well known to the world. The tests consists in ascertaining the amount of water condensed per hour from pipes of various sizes, both covered and naked. For our purposes tests of one size, viz., three-inch, under both conditions, will answer: The tests were not begun until the covering had become thoroughly heated and were then continued in each case through five hours time, during which time the condensed water was drawn off every fifteen minutes, and the steam pressure and the heat of the room noted similarly. The following is the record of the tests:

	Covered.	Naked.
Temperature of room	75	75
Steam pressure	50	47½
Temperature of steam	282.8	279.6
Ounces of water	52	137½

The results in the number of the ounces of water condensed shows the proportion of 52 to 137½ in favor of the covering. This shows only about 37 per cent, as much condensation with the covering applied as with the naked pipe. The question of covering, as in all practical problems, resolves itself to the simple point—will it pay?

In another case a series of experiments to determine the efficiency of non-conducting coverings instituted by Prof. John M. Ordway, of Boston, it was shown that a naked two inch pipe, carrying sixty pounds of steam, may condense 181 grams per foot per hour, while a covering such as we have referred to would reduce this condensation to say forty-five grams, thus making a saving of 136 grams per hour, or about 2.50 pounds of steam in a day of ten hours. Thus it is shown that covering 100 feet of two-inch pipe would save, in a year of 300 working days, coal enough to convert 88,800 pounds of water into steam. If we consider one pound of coal, as capable of making 8.8 pounds of steam we shall have a saving of five tons of coal per year for each 100 feet of covering. This experiment, it must be remembered, was made by using anthracite coal, worth say five dollars per ton at that point.

The Chalmers-Spence Company, of New York, have recently brought out an improved covering, consisting of consecutive layers or rolls of fibrous asbestos, made up in removable form, which costs twenty-two cents per foot, list, for two-inch pipe. This estimate would make a saving of over 100 per cent yearly on cost of this covering, while the covering once applied lasts for an indefinite period with ordinary usage. The saving, moreover, does not consist solely in the saving of fuel, for steam pipes uncovered become dangerous elements of fire, and in the mere matter of insurance a saving is effected, not to speak of the security one feels in the removal of this element of danger.

An impression also obtains in some minds that the covering of steam pipes, while desirable in the winter time, need not be done in the summer, or may be delayed until winter. The erroneousness of this will become apparent at a glance. Take, for instance, the temperature of live steam, eighty pounds, as 325°, and the average winter temperature as say 30°, with the summer temperature at say 70°; this basis, which we simply use as an illustration, leaves a difference of 40° of average variation, or only about 18 per cent of average loss in winter over that of summer.

In this connection we would remark that some experiments that would also settle with reasonable definiteness the loss of heat through the brickwork of ordinary boiler setting would be valuable. There are great differences of opinion on this subject, and careful experiments are needed to settle them.

BURNING WET OR DRY COAL.—The question of burning coal in a wet or dry state is still being discussed in the English journals, a large amount of both theory and practical information being set forth. One writer says that, although it is generally conceded to be true that wet bituminous coal will not produce as much steam in a boiler as dry coal, there are few figures to substantiate this. The result of a series of tests, made recently with much care, are regarded as having considerable weight in the determination of the points involved. It appears that a mass of washed slack, holding 18 per cent of water and 9 9-10 per cent of ash, evaporated 5 7-10 pounds of water per pound of fuel, while the same coal with only 3 per cent of water made from 8 to 8 5-10 pounds of steam; making due allowance for moisture by reducing to a standard of like quantities of coal free from moisture, a direct loss of 14 per cent is shown in using wet coal. In reference to this matter a contemporary says: Part of the prevalent impression as to the greater value of the wet coal is based upon the notion that in some way or other the water itself is converted into gas and burns with great effect, but this in the vast majority of cases is a delusion. The water on the coal as thrown on the fire must necessarily be slowly heated and at length fully evaporated by an absorption of heat from the burning fuel beneath it. The vapor thus given off passes away under the boiler and out at the stack, carrying with it a volume of heat corresponding to the temperature of the waste gas at the entrance to the stack, and also, what is far more important, the heat due to the conversion of this whole amount of water into steam. The whole of the heat thus absorbed is an absolute loss, and the more water there is in the fuel the greater this loss must be.

SHEET IRON AND SHEET STEEL. One of the large industries of the country consists of stamping or shaping very thin sheet iron and sheet steel into forms for various utensils and tin coating them. In many and most instances this is preferable to making articles out of tin plate, as the coating of tin completely covers edges and seams. The production of sheet steel is a growing industry. The United States Tin Plate Company, Pittsburg, whose works were burned last February have rebuilt the works of iron and have just completed a large ware house, and now have one of the most complete works of the kind in the country. The machinery was all made for the special purpose for which it is used, the manufacture of fine sheet iron and sheet steel. The capacity of the new works is 3,000 tons of refined sheet iron and steel per annum. It would be well if the government would place reasonable duty upon the foreign tin plate and enable this industry to become one of the pillars of our nation, giving employment to hundreds of thousands of Americans to do what is now done for us by England. The exports of tin plates from England to this country during the first four months of the present year reach the enormous aggregate of a fraction over 70,000 tons! and it is a product which might and ought to be supplied by our own home labor.

NEW PAPER PULP MACHINE.—Mr. G. H. Pond, according to the Glen Falls (N. Y.) *Times*, has devised a machine for the manufacture of paper pulp from saw dust. The working of the experimental machine was so successful that the inventor found no difficulty in interesting capitalists in the invention, and arrangements have been made by which a model machine will be built in that city immediately with a view of establishing a paper mill in which it is to be used. The paper further states that Mr. Pond's invention will work a revolution in paper manufacture. His experiments show that a fine quality of letter paper, as well as book, news and wrapping stock can be made from the product of his machine direct, thus doing away with the expense of beating engines and other ponderous machinery common to paper mills. He has made arrangements to establish a ten ton mill at once. Through his invention it is claimed that a ten ton mill can be put in operation for $50,000, when as by the present method of paper manufacture a mill of equal capacity will cost $150,000 or more.

A POINT IN WHICH AMERICANS SHOULD IMPROVE.—"In the appliances for doing work in boiler shops," says the *American Machinist*, "we are behind the British. Few American boiler shops are provided with the best appliances for bending plates, drilling, punching, flanging and riveting. Although the work turned out is just as good as can be produced on the other side of the Atlantic, the facilities for doing the work are generally inferior. There is room for great improvement in boiler shops."

AN EXPERIMENTAL STEAMBOAT.—The New York and Stonington Steamboat Line has recently launched a steamer which will have the true English type of an oscillating, compound, surface-condensing, direct-acting, side-wheel engine, the first in this country. The engine will have 10 feet stroke and feathering paddle-wheels. Her work will be looked forward to with great interest by steamboat men. All the machinery is on a level with the main deck. The boat will cost about $200,000. She is 305 feet long.

A CHANCE FOR INVENTORS.—The fire insurance companies of Sweden have offered a reward of 2,000 crowns for the most practical device to arrest sparks and cinders from locomotive and steamboat smoke-stacks. A trial of different devices that may be sent in will take place in Stockholm, Sweden, during the month of August, this year. Whether the award will be confined to the exhibitors at that time, we are not informed.

A SWIFT RUNNING ENGINE.—Durkee & Keffer are building a high-speed engine, designed to run 1,500 to 1,800 revolutions per minute, for electric lighting purposes. An especial feature of this engine is a very ingenious rotary automatic steam balance valve. The engine is made under patents recently granted to Dr. John Harrington, Caldwell, Kansas.

SCIENTIFIC PROGRESS.

Lunar Heat.

An interesting article on lunar heat, by Prof. C. A. Young, was published in the *Popular Science News*, from which we take the following: After mentioning the early investigations of the subject, Prof. Young speaks of Lord Rosse's experiments in 1868, which were made with the aid of a 3-foot reflector. "A moment's thought will show," continues Prof. Young, "that the moon's heat must consist of two portions. First, there will be reflected solar heat, the amount and character of which will depend in no way upon the temperature of the moon's surface, but simply upon its flooding power. The second portion of the heat sent us by the moon is that which she emits on her own account as a warmed body warmed, of course, mainly, if not entirely, by the action of the sun. The amount of this heat will depend upon the temperature of the moon's surface and its radiating power; and the temperature will depend upon a number of things (chiefly heat-absorbing power of the surface and the nature and density of the lunar atmosphere, as well as the supply of heat received from the sun), determined by a balance between give and take.

"So long as more heat is received in a second than is thrown off in the same time, the temperature will rise, and *vice versa*. This second component of the moon's thermal radiance must be mainly what is called 'obscure' or dark heat, like that from a stove or tea-kettle, and characterized by the same want of penetrative power. No one knows why at present, but it is a fact that the heat radiations from bodies at a low temperature have no such power of penetrating transparent media as the higher-pitched vibrations which come from incandescent bodies. A great part, therefore, of this contingent of the lunar heat is probably stopped in the upper air, and never reaches the surface of the earth at all. Now the thermopile cannot discriminate directly between the two portions of the lunar heat, but to some extent it does so, since they vary in quite a different way with the moon's age. The simple reflected heat must follow the same law as moonlight, and come to its maximum at full moon. The radiated heat, on the other hand, will reach its maximum when the average temperature of that part of the moon's surface turned toward the earth is highest; and this must be some time after full moon, for the same sort of reasons that make the hottest part of a summer's day come two or three hours after noon.

"The conclusion early reached by Lord Rosse was that nearly all the lunar heat belonged to the dark heat radiated from the moon's warmed surface, the reflected portion being comparatively small, and he estimated that the temperature of the hottest parts of the moon's surface must run as high as 500° F. Since the lunar day is a whole month long, and there are never any clouds in the lunar sky, it is easy to imagine that along toward 2 or 3 o'clock in the lunar afternoon (if I may use the expression) the weather gets pretty warm, for when the sun stands in the lunar sky as it does at Boston at 2 P. M., it has been shining continuously for more than 200 hours. On the other hand, the coldest part of the moon's surface, when the sun has only just risen after a night of 340 hours, must have a temperature more than 100° below zero.

"Lord Rosse's later observations modified his conclusions to some extent, showing that he had at first underestimated the percentage of reflected heat, but without causing him to make any radical change in his ideas of the maximum heat of the moon's surface.

"For some time, however, there has been a growing scepticism among astronomers, relating to the computations by which he inferred the high percentage of obscure radiated heat compared with reflected heat. Professor Langley, who is now engaged in investigating the subject, finds himself compelled to believe that the lunar surface never gets even comfortably warm—because it has no blanket. It receives heat from the sun, and probably some 25 or 30 per cent more than the earth, since there are no clouds and no air to absorb a large proportion of the incident rays; but at the same time there is nothing to retain the heat and prevent the radiation into space as soon as the surface begins to warm. We have not yet the data to determine exactly how much the temperature of the lunar rocks would have to be raised above the absolute zero (459° F.) in order that they might throw off into space as much heat in a second as they would get from the sun in a second. But Professor Langley's observations, made on Mount Whitney at an elevation of 15,000 feet, when the barometer stood at 17 inches (indicating that about 57 per cent of the air was still above him), showed that the rocks exposed to the perpendicular rays of the sun were not heated to any such extent as those at the base of the mountain similarly exposed; and the difference was so great as to make it almost certain that a mass of rock not covered by a reasonably dense atmosphere could never attain a temperature of even 200° or 300° F. under solar radiation, however, long continued. It must, in fact, be considered at present extremely doubtful whether any portion of the moon's surface ever reaches a temperature as high as 100°."

PURITY OF SEA AIR.—It has generally been thought, and direct observation has confirmed the notion, that the air above the sea is singularly free from the low forms of organic life. MM. Moreau and Plantymansion have taken advantage of their leisure during a voyage in the Gironde from Rio de Janeiro to Bordeaux to obtain some data bearing on this question. They have found that over the open sea, at a distance from the vessel, the air contained very little solid matter. The land breezes appear to become rapidly free from the multitude of organisms which they carry with them from populous districts. M. Miguel, of the Montsouris Observatory, regards the fall of germs into the sea as a reassuring fact; breezes blowing from the distant continents, which might otherwise bring epidemics with them, become purified, it is supposed, in crossing the ocean. The gentlemen above named have found that the atmosphere immediately about the vessel practically swarmed with micro organisms; the vessel seemed to be surrounded by an "atmosphere of microbes."

A New Coloring Matter.

Prof. C. F. Ritchel, of Bridgeport, Conn., has made some extremely interesting experiments with that pest of the household, the common moth, or rather the worm that comes from the eggs of the miller before it turns into a moth. The experiments are novel, and no account of them has been published.

"I first noticed," Prof. Ritchel said to-day, "that the excrement from the worm was the exact color and shade of the material it had eaten. I gave some of the worms red flannel as the first test, and the product was a beautiful shiny substance, the exact color and shade of the flannel. A very small quantity of this substance colored a large quantity of white lead. Knowing that modern artists could not mix black and white perfectly, or nearly even, and the difficulty of reproducing the color of gray hair, I gave my worms gray hair to eat. The result was very astonishing. They gave me a perfect coloring, the exact shade of the gray hair given to them. I mixed some of the coloring with white lead, and gave it to an artist, who was greatly astonished and pleased with it, and wondered how I got such a beautiful gray. I showed him a sample of the hair, and he said that it was a perfect match. I tested the coloring extract in many ways. I put some of it on a plate on the roof of my house, protecting it from the dust and rain with a glass. After an exposure of two months, I could not discover change in its appearance or shade.

"I am convinced," Prof. Ritchel continued, "that this was the method used by the ancients to produce their indellible and brilliant colors. I was told that such coloring as I had produced was worth many times its weight in gold. Lately I have stopped experimenting in this direction. For the benefit of art I would like others with time and inclination to take the matter up. All the apparatus necessary is a plain pine-wood box, with a smooth bottom."

GEOLOGICAL SURVEY OF MEXICO.—A project is under way among a party of American scientists to secure a contract with the Mexican Government for the organization and execution of a complete geological survey of the Republic. The primary purpose is to obtain accurate data as to the great economic resources of that country. Should the arrangements proposed be consummated, some of the best trained and most known geologists, naturalists, mineralogists, paleontologists and topographical engineers of this country will become interested. It is hoped also during the next administration to secure appropriation for such a complete and practical survey of the United States as is contemplated in regard to Mexico.

A NEW COFFEE PLANT.—A new coffee, called "Maragogipe," has lately been discovered in Brazil, and a commission was formed to investigate the qualities of the coffee and also of the plant, and they have decided entirely in its favor. Not only does it produce a larger crop, but the coffee berry is much larger, and possesses a very silky-looking smooth surface, with high quality flavor. It stands well on the high lands, and the first planters that have adopted it in Brazil are said to be so delighted with the results that they are cutting down their splendid coffee trees of the old variety of coffee and planting this new "Maragogipe" variety.

SUGAR IN MILK.—M. Paul Bert, the eminent French biologist, has been investigating the origin of sugar in milk. Two theories exist for explaining this phenomenon, one of which supposes that it is formed in the gland itself from milk-forming matter; the other supposes that it comes from the blood, and is merely stored in the breasts of animals. M. Bert has experimented with cows and she-goats, and found beyond doubt that sugar of milk is introduced by excretion in the breasts from sugar formed in excess by the animal. The sugar is apparently first formed in the liver.

EXPERIMENTS AT LOW TEMPERATURES.—Not only has oxygen been obtained in the form of crystals, as was lately announced, but Prof. S. von Wroblewski, Krakow, has also succeeded in causing nitrogen to fall like snow when subjected to a temperature of 303 degrees below zero, and in solidifying hydrogen. The extraordinary cold measured in these experiments was produced by the boiling of liquified oxygen on freeing it from pressure, and is probably the lowest temperature ever recorded.

MINING AND SCIENTIFIC PRESS.

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Passing Events.

The most notable item in connection with the mining interests is that mentioned elsewhere of the trouble between the mine owners and Miner's Union, at Tombstone, but rigorous measures have been taken, the troops called in, and doubtless the whole thing will quiet down.

News has arrived that the much talked of hydraulic mines in Africa have not turned out as well as expected.

Butte, Montana, is making a phenomenal bullion production just now, and there are more profitable mines near that camp than in any in the United States at this time. The Utah mines, too, are doing very well. The strike in the Quijotoa mines, Arizona, is confirmed and will result in much benefit to the regious thereabout.

The topic of the hour is the strange adventure of the Greely Arctic exploring expedition, and the hardships and suffering they experienced.

A new silver region is reported in New South Wales, and the mines there are being vigorously developed.

Two thirty-ton copper smelting furnaces were shipped from the Pacific Iron Works recently for the copper mines of Lost River, Idaho. The furnaces will be erected on the smelter site the head of Willow Creek gulch, within 000 feet of the copper mines. They will run ough about eighty tons of local ore per day.

Parallelograms in Mining Locations.

Mining people applying for patents on their ground have found that thoy must comply to the rules of the Land Office with regard to the end lines of claims and that their plats must show locations in the form of parallelograms, or they would he rejected. This rule has been in vogue since the law of May 10, 1872 was enacted. On all claims located since that date this form of location has been required. It made some confusion at first, for claims of all sorts of irregular shapes had previously been made. It seems now, however, that the rule is not to be enforced literally as the Secretary of the interior has just reversed a rnling of the Commissioner of the Land Office, and decided that the form of a mining location need not necessarily be that of a parallelogram; but the mineral deposit must govern.

The claim which brought up the question is near Leadville, Colorado, where the mineral deposits are peculiar in form, and not in lode form, as generally understood. The plat of the survey of the claim showed a location, running northeasterly 875 feet, measured along the line marked "center of vein," thence southeasterly, at a right angle with its former course, 450 feet; thence northeasterly, parallel with its original course, 175 feet. It is thns 1,500 feet in length, measured along said "center of vein," and it is 300 feet or less between the side lines. The location which was made September 11, 1877, appears to he surrounded hy other locations on all sides. A few feet south of the center vein of the location, and at its western extremity, is the discovery shaft, and a second shaft appears some 600 feet to the eastward, being a few feet north of said center line. There appears to have been no discovery of mineral elsewhere in the location. Affidavits set forth that the underlying mineral is found as a comparatively level deposit, irregular in form, in no wise resemhling a fissure vein, and not capahle of being traced by its ontcroppings.

The decision of the Commissioner of the Land Office holds, "that as the peculiar conditions do not exist, that would make such a location satisfy the intent of the mining act, it will be necessary to amend the survey, so as to conform to all the requirements of the statute, Section 2320 R. S., as constructed by the Land Office, to wit: A lode claim must be to all intents and purposes essentially a parallelogram."

The Secretary of the Interior says in his decision that such a construction should be founded on the reason of the thing, or the clear intent of the statute. As to the former, he fails to perceive any reasonableness in the requirements of a parallelogrammic form. If a fissure vein deviates literally at an angle, it is reasonable, as the primary purpose of the statue is to grant the mineral, that the location should deviate with it. If the mineral is not deposited in a fissure, but in irregularly shaped masses, as in this case, then as it can in no wise affect the interests of either the United States or adjoining locators whether any given L shaped lot be covered by one or two locations, it is unreasonable to hold that it shall not be embraced by one location.

This decision is a very important one, overturning as it does the former practice of requiring all locations to he parallelogram, and the Secretary's reasons for his conclnsions are very interesting. He says in his decision:

Turning to the statute referred to it reads that "a mining claim located after the 10th day of May, 1872, may equal, but shall not exceed 1500 feet in length along the vein or lode," and that "no claim shall extend more than 300 feet on each side of the vein at the surface." It is apparent that the purpose of these provisions is to limit the dimensions of the location, and not to prescribe its shape. It is to be not more than 1500 feet long, and not more than 600 feet wide. The point of measurement selceted is the "vein," and if the measurements be made along and from the middle of a veiu which departs literally from its course at a right angle, it is obvious that the statute is satisfied. Precisely the same quantity of land and of lode is appropriated by an L-shaped as by an I-shaped location, where the length and width are determined from the middle of the vein. "There is no language in the Act" says the court in Wolfley vs. Lebanon M'f'g. Co. (4 Col., 112), "that requires the diagram to be in the form of a parallelogam or in any other particular form." I will go furtber and says that the language of the statute precludes the conclusion that it contemplated a parallelogrammic location. The requirement of such a shape might be inferred if the langnage bad been "no claim shall exceed 1500 feet in length by 600 in width;" bnt the introduction of the provisions requiring a measurement of length "along the vein," and of width from "the middle of the vein," plainly points to a reason for the selection of the central line of the location instead of the side line, and that reason must have been the possible tortuous course of the vein. There could be no practical purpose in selecting the middle of the vein as the place of measnrement except to provide for an appropriation of the same quantity of surface hy a deflecting as by a straight location.

Since the statute anthorizes an L-shaped or other irregularly shaped location in the case of a fissure vein, it must authorize it in the case of a horizontal deposit, such as is found in this case, if the reason of the thing does not forhid.

That such a deposit is within the meaning of be descriptive term "vein" or "lode" in the statute is settled (Stevens vs. Williams, 1 McC., 480), and I have said above that there are no practical considerations opposing it. Therefore I see no reason for objecting to the location in the ease before me, and reverse your decision.

Exploding Giant Powder Without Caps.

A miner, employed at Ivanpah, has hit upon a new way of exploding giant powder that may work a revolution in the use of that explosive. It has always been helieved that giant powder would not explode without the fulminate cap, and in the use of the cap was the great danger to be apprehended. Our miner, who, by the way, is a sailor, without any miner's experience, ran out of caps, and seeing no reason why the powder should not explode without, just placed his fnse in position, tamped his charge and ignited the fuse; the result was that it exploded as well as thongh a cap had been used. The result did not surprise him, but it did the miners, who at once began to experiment, and have been exploding giant powder without caps since, and find that it does just as well as with them, while the danger of premature explosion from the cap in tamping is avoided. No one thought of it before, and if our sailor had known more of mining he would not have thought of it.—*San Bernardino Times.*

The above item has been going the rounds of the press within the past few weeks, and it is perhaps just as well to caution miners on the subject. A good many people call all the high grade powders "Giant Powder." With Judson powder, made by the Giant Powder Co., the blasts may be fired in the manner mentioned. But the real Giant powder needs a special cap to explode it, to utilize all its powerful qualities. A miner may sometimes succeed in discharging a blast in the manner described above, if he tamps very firmly, but he will lose a good many shots. Even when very solidly tamped it is liable to miss-fire unless caps are nsed. The company do not advise exploding any of these nitro-glycerine powders without caps, because, with all that class of powders, the stronger the explosion in the powder the better the execution of the hlasts.

It has been found that even the triple-force caps do not explode every particle of the nitro-glycerine which is distributed through the powder, but particles of unexploded nitro-glycerine float like atoms in the air after an explosion, and are principally the cause of the miners' headaches when blasts occur.

When the Giant Powder Company in this city first made their powder they sent out ordinary single-force caps to nse with it. But it was found there were miss-fires, and the powder did not do as much exeeution as was expected. They then investigated the matter, and as a result made double-force eaps, and finally triple-force ones—that is, with three times the quantity of fulminate in them. Now they are even making quintuple-force caps, and several of the large consumers now order these quintuple force caps, finding they get better resnlts from the blasts.

In Europe this matter has been very thoroughly investigated, and there they recommend qnintuple-force caps, and say that the slight difference in price is of little moment, because it is an undeniable fact that the stronger the explosion in the body of any nitro-glycerine powder the more complete the explosion of every particle of nitro-glycerine. These facts should be known in connection with the item quoted, for when the powder is set off by a simple fuse there must be considerable nndecomposed nitro-glycerine left in the air, and the effect of the blast will be proportionately less.

ACCORDING to the Eureka *Sentinel* the Miners' Union have served a notice upon the Eureka Tunnel Consolidated Mining Company and the men working in the mine that hereafter miners will not be allowed to work in it underground on any other condition than $4 a day in coin. They had heen working for $2 a day in cash and $2 additional, making up the required $4, in stock of the company. The owners of the mine have determined to shut it down..

Separating Gold and Silver from Arsenide of Iron.

Mr. Edward Probert of Eureka, Nevada, has just patented through the MINING AND SCIENTIFIC PRESS Patent Agency a process of separating gold and silver from arsenide of iron. The arsenide of iron is first melted in a shaft, cupola, or other furnace, and then tapped out into iron pots lined with clay or other refractory substance. While the material is still in a fluid state and at its highest possible temperatnre, Mr. Prohert introduces a certain proportion of its weight of granulated lead or litharge into it. The litharge is reduced by the action of the deoxidiziug agents contained in the arsenide of iron, and the lead is precipitated, carrying down the gold and silver alloyed with itself. The granulated lead, when used as the equivalent of litharge, acts in a similar way, though with less effect, alloying itself with the silver and gold hy its affinity for those metals during its passage downward throngh the hath of molten material.

The material treated by Mr. Probert is shown by analysis to contain about 33 per cent arsenic, 60 per cent iron, with minute quantities of other metals, ineluding silver and gold. In order to remove the argentiferous or auriferous lead alloy from the pot, a small tapping holo is provided in the hottom, or the whole contents may he allowed to cool, and the lead alloy finally he separated after the solid block has been removed from the pot.

Of course the inventor is aware that litharge is universally employed as a flux in assaying and smelting ores; but in this operation it is nsed for the purpose of dissolving the metallic oxides and otber substances constituting ores, and is, therefore, a true flnx, and is used as such as well as to absorh the precious metals contained in the ores. But he has found that this process does not give as satisfactory results when arsenide of iron is present as that which he has discovered. The reactions do not take place as certainly nor as completely in ordinary smelting as by a subsequent treatment of the previously smelted arsenide with litharge or lead, and it is precisely in this subsequent treatment in pots outside the furnace that the value of Mr. Prohert's improvement consists. He does not, therefore, patent the nse of lithargc or lead for separating gold and silver from arsenide of iron in the ordinary process of smelting, but simply his process, which is to treat the previously smelted substance (arsenide of iron) with granulated litbarge or granulated lead, while it is still in a fluid state, in iron pots lined with refractory material to resist the corrosion, outside of and apart from the smelting furnace.

California at New Orleans.

The Central Pacific Railroad Company has decided to take in hand the matter of representing California's industries at the coming exhibition at New Orleans. They propose making here a complete collection of all California products—mineral, agricultural and industrial, and forward it to the exhibition. They will take samples of soils, fruits, eereals, minerals, manufactured articles, etc. The display will he made as a State display, and will be made as complete as it is possihle. Suitable persons will he sent in charge to describe and explain the exhibit. The company expects the people of the State to contribute, and the namcs of contributors will he appended to the articles. The railroad compauy will transport everything free, and prepare its exhibition free, taking charge of the whole thing. The eompany will co operate with the State Commissioner. There has been no appropriatiou made by the State for an exhibition, so that the railroad company will have to bear the expense itself. A number of county collections have been or are hein made, so that this action of the railroad people ensures California being properly represented at the great exposition.

THE Eureka *Leader*, in an article showing how well foreign capital bas succeeded in Nevada, says: Of the amount invested in this district by foreign capitalists, about $900,000 has come from England, and about $600,000 from the United States. Since the opening of the district less than $2,000,000 in assessments has been levied in our mines, while over $8,000,000 has been paid in dividends, showing an excess of dividends over assessments of over $6,000,000.

White Bronze.

White bronze is a comparatively new substance, but which has come into large use rapidly for special purposes. It has been found to be so particularly well adapted for statuary and monuments, that a company with extensive capital has been for some time organized in Detroit, and is making monuments of all kinds and styles from the value of a few hundred dollars up to $25,000. From exhaustive experiments made by this company it is found that the material will stand exposure to the weather and the ravages of time for thousands of years without detriment. Mr. James Linforth, 23 Main street, in this city, who is the agent for these monuments on the Pacific Coast, has investigated the subject carefully, and informs us that the material is practically indestructible. White bronze being non-corrosive, and unchangeable, is equal to gold, silver or platinum, and superior to copper or antique bronze, which throws off a verdigris. In color, white bronze is more appropriate than any kind of stone, the latter readily yielding to the action of the frost, and in addition to becoming moss grown and discolored, soon shows signs of disintegration. It is rare to find a monument, either marble or granite, free from cracks after twenty years' exposure.

These monuments and statuary are cast from refined zinc, and are given their sparkling appearance by the sand blast; sand being blown against the work, under a high pressure of steam, cuts the surface, but does not adhere to it. Aside from their durability, one of the principal advantages over stone is the legibility of inscriptions, which are cast in raised letters and will not crumble or become indistinct. By means of removable tablets, the monuments always present a finished appearance. Tablets not required for inscriptions at time of erection, are cast with appropriate emblems to be replaced by inscribed tablets when circumstances require.

The use of statuary in this country by private individuals, in the adornment of their cemetery lots, used either alone or in combination with a monumental pedestal, is of comparatively recent date. In the last fifteen years a decided preference for this class of work has been developing, and at the present time many of our largest and finest private monuments are surmounted by statuary. It is an admitted fact that stone statuary, more especially marble, will not withstand the effects of severe climate for even a few years, while copper bronze throws off discoloring matter, which not only renders the statue unsightly, but soon injures, if not ruins, the pedestal. White bronze is open to none of these objections, and will retain its original color and beauty for generations.

A thin film of oxide which forms on this bronze is indestructible by the elements. It cannot be dissolved by water and air cannot penetrate it, though the film is so thin as to be unmeasurable. No corrosion can take place.

The company which manufactures these monuments has hundreds of designs more or less ornamental in character. They are artistically planned, and the ornaments are appropriate. There is nothing to chip or break off. Some of the soldiers' monuments which they have made are very elegant, indeed. A sample of one of the designs is given on this page, though much more elaborate ones are made. Skilled artists are employed to make the designs, and skilled workmen complete the monument. Tablets, emblems, family and public monuments, railings, medallions, statuary and similar articles are made. The inscriptions are all in raised letters which form part of the monument, and cannot be broken off. Mr. Linforth has a large list of designs which he will show to any one interested. For our city, where the sea fogs affect stone and marble, so much, the white bronze ought to be specially valuable.

A number of scientists whose certificates are given in the company's catalogue, unite in saying: "The white bronze monuments are practically indestructable. They will not blacken or become dingy with age. Moss will not adhere or grow upon their surface as upon marble and the color will remain unchangeable while the monuments endure. Imperishable by nature and ever enduring in beauty. In our opinion these monuments will out last the foundations on which they stand."

A New Silver Region.

Australia has long been noted as a gold producing country, and now what bids fair to be an extensive silver producing region has been found. The mines are in the Barner ranges of New South Wales, near where the colony joins South Australia. Silver-bearing ores were first found there in 1872, by a shepherd, but the nature of the ore was not understood, and nothing was done. Two years ago a lot of ore was sent to England, this time with better results, though through inexperience the miners selected the lowest-grade ores, viz.: argentiferous galena. They netted the handsome return of £7 per ton on the shipment, after the highest commissions and charges had been exacted. Miners who were working silver properties in these parts were all making money before they sold out.

Now there has been an influx of miners and a town kown as Silverton, has been built up. The country is represented as inhospitable, rocky and mountainous. Over the whole of the great mountain chain are found localities of the precious metals, and following their leading structural idea, they arrange themselves in parallel zones of a similar nature to those of the Cordilleras and California.. Where the section of the formation can be examined there can be seen folds of more or less complexity, twisted and warped by longitudinal forces, and often compressed into a series of zigzags of a wonderful nature. The mines of this district consist of two groups. The one at Silverton embraces eleven claims, in which the ore consists of sulphides of lead or argentiferous galena. The profits secured on these ores amount to £12 per ton. About eight of these mines are opened up, six of them to a considerable extent. There is one shaft down 130 feet, carrying the lode very strong in the bottom. The lode at this point gives indications of turning from sulphides of lead into sulphides of silver. Fifteen shafts have been sunk on different parts of these eleven mines, their depth varying from 30 feet to 75 feet, one being 130 feet. The lode is disclosed in each of these shafts, and found to be of a thickness varying from 1 foot to 3 feet. Some rich returns are now being obtained from these mines, the ore yielding, as above stated, a clear profit of £12 per ton. The second and larger group of mines is situated at a distance of 28 miles from Silverton. They are called the Lakes Camp group. The ores here are purely sulphides of silver, and very rich. Two tons of ore recently sent to England for assay were sold for £600. Shafts have been sunk in many parts of the ground held by the syndicate, and ore has been discovered everywhere, but, of course, all of it is not of the richest quality.

The lodes have all the appearance of permanency. In one shaft, the deepest of this group, the lode has been traced to the total depth—75 feet—and at the bottom it is six inches thick, with indications of continuance and improvement. A great drawback to the rapid development of these mines is the scarcity of labor at Silverton.

MONUMENT MADE OF WHITE BRONZE.

Prospecting is very lively along the whole line of the Carson and Colorado, from Hawthorne to the terminus of the road. The Virginia *Enterprise* says the railroad is a great convenience to prospectors in many ways. It carries their traps and provisions from place to place, and when they have found a vein that will pay, it carries their ore to where it may be brought to mill test and reduced. Small lots of ore are constantly being sent in to the Douglass mill, at Dayton, either to be tested or reduced. Now, too, there are beginning to be mills and furnaces at the other end of the road, down in Inyo, to which ore may be sent.

Fuse Works Burned.— A dispatch from Santa Cruz dated August 13th says: The Eagle Fuse Works, on the Zayante creek, near Felton, were entirely consumed by fire this afternoon, including a large amount of valuable machinery. The works were owned by W. H. Talbot & Co. and have been in operation since 1869. The process of manufacture is a family secret and the loss is not definitely known. The factory turned out about 1,000,000 feet of fuse a month.

Trouble at Tombstone.

We have before mentioned the fact that there has been trouble at Tombstone, Arizona, between certain mining companies and the Miner's Union owing to the determination of the former to reduce wages from $4 to $3 per day, and for three months many men have been kept out of work. On the morning of the 9th about three o'clock, after the night shift had left the Grand Central mine, an armed mob went to the works and fired into them. The Tombstone *Epitaph* says: "The guards, seven in number, were then organized for resistance, expecting what was to follow. Soon a union man came to the door and asked the stereotyped question of Mr. Leach if he intended to continue work at $3 a day, to which that gentleman replied by making the emissary a prisoner. Not long afterwards several shots were fired into the building from behind a woodpile on the upper side of the works, which were promptly returned by the guards, and in the excitement of the moment the prisoner managed to escape. About a hundred shots in all were fired, and sixty empty shells were found this morning behind the woodpile. Whistles were sounded to alarm the town, and the mob rapidly retreated. The most singular thing about the entire transaction is that not a man is known to have been hurt in the past twenty-four hours, although it is whispered that a certain union man wishes he had been elsewhere on the occasion."

The next day the following notice was published signed by Wallace Corbett, C. S. Butterman, C. W. Leach, Casper Taylor, C. W. Goodale, and W. J. Fee. "To whom it may concern. Unless the Miners Union of Tombstone, formally disband before 3 p. m., Sunday, August 10th instant, and deliver over to the Sheriff the ring leaders of the cowardly assassins who made an armed attack on the Grand Central hoisting works last night, no man whose name is now on the roll of said union can ever have any work at any price on the mines or property of the companies represented by the parties whose signatures are hereto affixed."

A dispatch from Tombstone dated the 12th, says: "Since the attack on the Grand Central hoisting works everything has been quiet. This morning Captain Tisdale, with Company C, First United States Infantry, arrived from Fort Huachuca and has gone into camp at the Sulphuret mine, near the scene of the recent attack. Sheriff Ward, denied having made any requisition on the Governor for troops, deeming the civil authority amply able to preserve order. The troops are here, however, and will probably remain until all probability of trouble is over. About 200 men are at work, which force will be increased largely in the nearfuture. In a few days work on the new pump at the Grand Central will begin. The future prospects of the camp are bright."

Miners' Safety Lamp.

Some months since we mentioned the fact that an English gentleman, Mr. Ellis Lever, had offered a prize of $2,500 for a safety miners' lamp which would fulfill certain conditions. The matter was referred to a committee of experts, who have just reported. The adjudicators have had to examine 108 lamps; of these four were electric lamps and 104 oil lamps, of which a few were designed to burn mineral oils. With respect to the electric lamps, there was not one which fulfilled or approached fulfilement of the conditions of the award. All the lamps which fulfilled the preliminary requirements were submitted to a series of experiments of progressively increasing severity. These experiments, based upon the experience gained by the Royal Commission, and by experiments instituted by other bodies in this country, were calculated to fulfill even exceptional conditions to which lamps may be exposed in actual practice. While there was a consiederable number of lamps which behaved satisfactorily under the normal conditions existing in mine workings, the number was reduced to very few as the extreme tests were reached. Of these there is no one lamp that perfectly fulfills the whole of the conditions enumerated, and the adjudicators are consequently unable to make the award to any one of the lamps submitted. Among the best there are two which the adjudicators regard as deserving of special mention, viz., the Marsaut lamp, with three gauzes, which most nearly fulfilled the conditions, and the lamp of Mr. William Morgan, of Pontypridd, South Wales, which presents several good features of marked originality.

Production of Pig Iron.—A dispatch from Pittsburg, Pa., says: From present indications the scheme to restrict the production of pig iron by hanking up all the furnaces in the country will be successful. Secretary Weeks of the Iron Association has received responses from 200 furnaces, and of these 121 are unqualifiedly in favor of the plan and will support it. If a shut-down is ordered it is prohable that there will he a general suspension of the coke works also, as 75 per cent of the coke made in the Connellsville region goes to pig-irou furnaces.

Facts about Wire Rope.

Iron, which within the last two or three decades has invaded the province of so many other materials, in the arts, has also become a large competitor with hemp, being now extensively employed in the manufacture of ropes, for haulage in mines, for the heavier parts of ship's rigging, as a substitute for belting, and for many other purposes. In some uses it has almost superceded hemp.

Iron ropes used in Germany about 1831 for hoisting purposes in Hartz mountains were made from long iron rods laid side by side and untwisted, being wound spirally around by wires to keep them in place.

The earliest record we have of wire ropes made from wires twisted together into strands and the strands laid into ropes is from the patent of Andrew Smith of Prices street Leicester square, in the county of Middlesex, Eng., who in January 12, 1835, obtained a patent for "a new standing rigging for ships and vessels and a new method of fitting and using it;" and in March 26, 1836, he obtained a patent "for an improved mode of manufacturing bands, belts and straps to be employed in place of ropes and chains and for other useful purposes," followed by patents for improvements in the same, Dec. 21, 1836, March 20, 1839, and later; and Appleton's Dictionary of Mechanics for 1852 give results of tests of Mr. Smith's wire ropes.

The first wire ropes as we understand ropes in the present day were made from a number of small wires set up on spools back of a stationary laying plate containing a series of holes arranged in circles around a center hole, *i. e.* 6 holes around one, then 12 around 6 and 18 around 12, etc. The wires were pulled through these holes and formed into strands by a revolving machine which receded from the laying plate along a track on a long rope walk. These strands were afterward laid up into ropes in a similar manner to hemp ropes. But about 1845 Mr. Smith invented a machine for making wire rope strands of untwisted wires, and this is the principle on which wire ropes are made to the present day. Mr. Andrew Smith, in 1831, had invented iron shutters and he found that the ropes he used for counterbalances were often destroyed by rats, and as a substitute for these ropes he experimented with cords made from fine wire. In 1836 he established rope works in Great Grimsby and later at Millwall near London, in both of which places Mr. Binks was for many years his foreman.

Flat wire ropes were originally made from bunches of fine wires laid parallel and forming strands which were bound together by being woven in a loom with tarred spun yarn or marline as a woof, the bunches of wires forming the warp, afterward some twist was given to these wires, and eventually a series of four stranded ropes laid alternately right and left handed were sowed together by wires running at an angle crossways formiug the flat wire ropes of the present day.

Mr. Melville Atwood, the well-known mining engineer of this city has probably had the longest experience of any man living, having used one of Andrew Smith's wire ropes over 40 years ago.

Wire rope was introduced into the United States a few yeas after it found its way into England. It was first employed on a large scale upon the inclined planes of the Portage railway, over which the hoats of the Pennsylvania canal, divided into sections, were transported across the Alleghanies. The roads of the Delaware and Hartford Canal Company soon after adopted them. The success in these instances led to the adoption of still heavier ones—2 to 2½ inches in diameter—upon the inclined planes of the Morris and Essex Canal of New Jersey.

The use of wire rope for hoisting purposes is now almost uuiversal. It is used for a great variety of other purposes. One of its most important uses is that for

The Transmission of Power

From one locality to another, when the distance to be traveled is such as to render belting unsuitable. At Frankfort-on-the-Main the power of a 10 horse-power turbine is transmitted 3,200 feet to a cotton factory, which is situated on a convenient position. Wheels 13½ feet in diameter are used, and they make 114 revolutions per minute. A ⅝-inch wire rope is used; stations, 400 feet apart. A series of powder mills, embraciug the various shops where the compounding, grindiug, sifting, glazing, etc., are carried on, are arranged in a series around the circumferenee of a circle of 1,200 feet radius, the machinery being driven by wire ropes from a water wheel in the center of the circle. The buildiugs are isolated by traverses, and have the heuefit of the detached situation without the uecessity for separate motive powers.

At the falls of the Rhine, near Schaffhauseu, a number of turbines are placed, having an aggregate of 600 horses. This is transmitted diagonally across the river to the town, which is about a mile lower down, and then distributed, advantage being taken of certain rocks in the river as foundations for the carrying rollers.

Another notable instance of the trausmission of power by wire rope may be found at Oberursel, Nassau, where a 175-horse water power is transmitted by a single wire rope for a distance of 3,150 feet, divided into eight spans. The useful effect of the 175 horse-power transmitted is found, by careful measurement, to be 99 horse-power. The ropes are .59 inch in diameter and run with a speed of from 55 to 60 miles an hour, over pulleys 14.8 in. diameter. It is claimed that power can he thus conveyed through distances of six and seven miles and upwards.

More recent experiments have demonstrated that wire ropes can be run over quite long distances more economically thau by dividing up into sections.

In this city there are numerous examples of wire rope transmission at the Risdon Iron Works and at the California Wire Works. This system is employed quite successfully.

Its Use for Suspension Bridges.

The application of this material to suspension bridges was made in 1844 and in 1850 it was called to a still more important use, for electric transmission of intelligence, across rivers, seas and oceans. These two applications gave a greatly added value to the importance of wire rope and its manufacture, which now became the subject of a great number of patented processes.

Important improvements were about this time, introduced into the manufacture hy Mr. John A. Robeling, who produced, at his works at Trenton, N. J., the great cables, upon which he swung the suspension bridge at Niagara, and later those cables of still greater mammoth propositions, which now sustain the immense structure, which connects New York city with Brooklyn.

Propelling Street Cars.

One of the most recent applications of wire rope, is its use for propelling street cars, by what is called the "cable road system." This system was first conceived, and carried into practical use by our fellow citizen, A. S. Hallidie, etc.

Care and Durability.

A writer of wire ropes says:—"These wire ropes require great care and attention, and their durability depends in a great degree upon the care taken of them, aside from the actual work they have to do. In damp and heated places, the surface of the wires is protected hy suitable material such as tar, grease or special compounds. The winding on the reel and the varying strains has an effect in deteriorating also.

"The question of actual strength of rope in relation to working load and velocity is being investigated in Europe hy careful persons. It is not probable that the factors of safety adopted hy rope makers can he materially altered, still it would he interesting to determine separate factors for dead weight and velocity, and also for various sizes of ropes. As it is there is some margin, the working load being given by English manufacturers at from 1-8 to 1-10 of breaking strain, the difference being, presumably, for varying velocities. In France the Commission appointed to report on breakages of colliery ropes stated that the best firms only loaded their ropes to one-tenth of breaking strain; hut in small ropes of good wire, where each wire bad its own share of work, this was occasionally increased to one-sixth. In Belgium the factor of safety is one-seventh; in Germany one-eighth to one-ninth. The deterioration of ropes by wear is also an important question. The Commission just referred to state that new and old ropes vary in the proportion of 100 to 55, and that the difference in strength in individual wires, while not averaging more than 13 per cent., approach 75 per cent in worn rope. The same authorities state that in flat ropes the results are still more marked, as the wires will not, after use, stand one hend in the vice, which is partly attributed to the cutting action of the stitching wires. Now this question, which means the alteration in the nature of steel or iron wire, is a very important one, as it must regulate the life of a rope, although apparently uninjured."

The Manufacture of Wire Rope.

For making wire rope the very best material is selected, and the bars are rolled down at a welding heat to wire about one-fourth of an inch in diameter. This is then cleaned in warm water acidulated with a little oil of vitriol, and, being coated with a paste of rye flour, it is drawn through a succession of holes in a wire plate until it is reduced to the thickness of No. 9 wire, when it is annealed by heating from five to eight hours, and is then cleaned and drawn down again until it is of the required degree of fineness.

There are two kinds of wire rope manufactured. Ropes with nineteen wires to the strand are more pliable and are generally used for hoisting ropes. Those with twelve or seven wires to the straud are stiffer and are best adopted for guys, ferries and rigging. Wire ropes are made with six strands, with a center of hemp or wire, the former being more pliahle, and will wear better over small pulleys and drums. Wire rope is as pliable as new hemp rope of the same strength, and the greater the diameter of the sheaves, pulleys and drum, the longer the rope will last.

Although a few years ago wire ropes were generally made from the best of iron—Norway or Sweden being preferred—steel, in its wonderful progress, has largely pushed iron aside, especially wherever wire ropes are used for winding over a drum or pulley, or for hoisting, while the best of iron wire will hear a breaking strain of 100,000 pounds to the square inch of section.

Crucihle steel wire is made to-day capahle of resisting a strain of 250,000 pounds to the square inch. It will he thus seen what a range there is in the quality of wire rope, for while inferior iron wire will not stand over 70,000 pounds, the hest kind will run up to 110,000 pounds per square inch; and while inferior steel, such as Bessemer, will not take over 90,000 pounds to break it; carefully selected steel, made in small crucihles and able to take a temper at an ordinary red heat, will go as high as 250,000 pounds per square inch of section. Therefore it behooves those using wire ropes to know from whom they are buying and to know what they are buying.

Then, again, the kind of a rope required depends upon the conditions under which it is to work, and unless the person using the rope has given the matter some attention he should consult a reliable maker and get his advice. To order a *steel* wire rope means very little, because steel may be Bessemer, Siemen-Martin or crucible, and may be made from wire costing 6 cents per pound or from wire costing 16 cents.

In selecting a wire rope for hoisting, the first thing to know is what load you are going to lift, and the "load" must include the weight of the rope and the hucket or cage; then the size of pulley and drums it has to wind on. If the pulleys and drums are very large in proportion to the load to he lifted, a coarse rope, made from 6 strands of 7 wires each, can he used; otherwise, a flexible rope, which is usually made from 6 strands of 19 wires each, is to he preferred. And, as a rule, crucible steel wire that is capahle of bending over its own part, straighten out and repeat in the same spot, and that will stand a strain of 165,000 pounds per square inch, is the wire to have in the rope.

If your drums and pulleys are not made, and you have determined the size rope you want, then multiply the diameter of a wire in the rope hy 1,500. This will give you the diameter of the drum and pulley over which the rope bends in inches.

All ropes stretch hy tension and wear; winding rope will stretch from ½ to 1½ per cent before partiug. If they stretch much more than this it shows that the wire from which the rope was made is too soft.

Many makes form these ropes of wires of various sizes, but experience condemns this as a makeshift. The hest ropes are made from wires of uniform diameter and with a well-tarred, compact hemp, jute or manilla center.

All the wires in a wire rope should be equally strained, a tight wire among a lot of slack ones will soon hreak. Wire rope makers long ago found out that machines which made the strands and the rope at the same time could not he depended on to overcome this trouhle, and now the strauds are usually made first and afterwards laid up into ropes.

Ropes usually wear out through the abrasion of the exposed wires of the strands, and the section of the wire that originally was a true circle, when worn out, will show at the breaking point a circle with a segment sliced out. This has suggested making the outer wires with a flattened face exposed to the wear and various other modifications in order to prolong the life of the ropes.

However large the wire may be, the least wear on the outer surface weakens it considerably. At the same time, a straud of seven wires, *i. e.*, one wire surrounded by six, equal in size, is nearly perfect, each touchiug its neighbor, and also the center one, and if you lay around these seven wires another layer of twelve wires of equal size which just about covers them, you will have what is called a "flexible strand." For the same reason, six strands in a rope are hetter than four or five, as they make it rounder, and consequently the friction is hetter distributed.

Wire ropes are spliced without difficulty. They are also easily secured at the ends by a metallic socket variously fastened to them; and in similar methods, hook clevices, turn buckles, or other similar appendages are attached to the ends, and serve for facilitating the tightening of the ropes when they are employed for the standing rigging cables or for other purposes requiring occasional shortening or lengthening.

Table of Relative Strength.

The following table of the relative strength of the several sizes of wire and hemp rope, together with their proper working load and breaking strain is furnished from a reliable source, and it is arranged in a natural way so that anyone can select a rope to do a certain work, the initial column being the working load, the second column the breaking strength, then the sizes, weights of different ropes, and chain of equal strength. It will be noted that the sizes of wire ropes are all given in circumference. The diameter does not give the true size, and varies as you measure ou the projecting parts of the strand or the spaces between, whereas the circumference is iuvariable and being as 3 to 1, for the diameter is proportionally more accurate.

The first wire rope ever made on the Pacific coast was made by Mr. A. S. Hallidie in 1856 for Messrs. Brooks & Berry at the Bay State mine, on the American Bar of the middle fork of the American river. The wire was bright iron wire and was carbonized by Mr. Hallidie hy treating it in a charcoal pit for a number of days. The rope was 2,200 feet long, two and a half inches in circumferenee, and was made to take the place of a hemp rope seven inches circumference. The hemp ropes wore out every four and a half months, and the rope made by Mr. Hallidie (by machinery made by himself on the ground) in three pieces and by him spliced together, lasted two years. A year later Mr. Hallidie commenced the manufacture of wire rope in this city, and continued to do so until 1882, when his business was assumed by the California Wire Works, who are now carrying on the manufacture of wire ropes under his supervision. For many years the only place in the United States where flat wire ropes were made was in San Francisco, and the reputation of these ropes have extended all through the country. In a future number we will endeavor to give a history of wire, its development and present uses.

Capacity of the Ropes and Chain. Working Load, lbs.	Breaking Strain, tons	Round Charcoal Iron Wire Rope. Circum. in inches.	Weight per 100 ft.	Round Crucible Steel Wire Rope. Circum. in inches.	Weight per 100 ft.	Round Hemp Rope. Circum. in inches.	Weight per 100 ft.	Flat Charcoal Wire Rope. Size in ins., width and thickness.	Weight per 100 ft.	Flat Crucible Steel Wire Rope. Size in ins., width and thickness.	Weight per 100 ft.	Iron Chain. Diameter of link.	Weight per 100 ft.
200	1	1	17	...	...	2¾	33	...	...	...	...	...	...
300	1¼	1¼	23	...	...	3	50	...	...	...	...	...	...
550	1¾	1½	30	1	17	3½	78	...	...	...	...	...	...
1,000	2	1¾	41	1¼	30	4	100	...	...	...	...	...	...
1,500	2½	2	50	1½	41	4½	100	...	...	...	...	...	...
2,000	3	2¼	65	1¾	50	5	166	...	...	...	...	...	...
2,500	3½	2½	80	2	65	5½	166	...	...	...	...	...	...
3,300	4	2¾	100	2¼	80	6	250	...	...	...	...	...	...
4,200	4½	3	124	2½	100	6½	333	...	...	...	...	...	...
5,000	5	3¼	146	2¾	124	7	333	...	...	...	...	...	...
6,000	5½	3½	168	3	146	7½	333	...	...	...	...	...	...
7,000	6	3¾	190	3¼	168	8	400	...	...	...	...	...	...
8,000	6½	4	210	3½	190	8½	400	...	...	...	...	...	...
9,000	7	4¼	230	3¾	210	9	400	...	...	...	...	...	...
10,000	7½	4½	250	4	230	9½	400	...	...	...	...	...	...
11,000	8	4¾	270	4¼	250	10	400	...	...	...	...	...	...
12,000	8½	5	290	4½	270	10½	400	...	...	...	...	...	...
13,000	9	5¼	310	4¾	290	11	400	...	...	...	...	...	...
15,000	10	5½	350	5	310	12	400	...	...	...	...	...	...
22,000	12	6	540	5½	540	14	1,000	6 x 3	630	6 x 3	630	1	1,000

—*Millman and Mechanic.*

Mineral Deposits in Contra Costa.

Many of our readers will readily recall to mind, the excitement developed in this county some twenty years ago, by the supposed discovery of copper and quicksilver ore in the hills around the base of Mount Diablo, and the large amount of labor performed, and considerable sums of money expended in the fruitless endeavor to unearth either mineral in paying quantities. Plenty of specimens and small pockets were found of undoubted richness, but in no instance in sufficient quantity to be of remunerative value. The prospectors were men of little or no experience or scientific knowledge in the branch of mining required for properly carrying on the work, and it is not surprising that the wasteful and hap-hazard method of working resulted in failure, even if in some instances really valuable veins existed. Many people still adhere to the opinion that both copper and quicksilver, particularly the latter, could, with the added experience of twenty years hy mining experts, be found and mined with profit. We know that at least one considerable shipment of quicksilver was made to the city, when the company producing it quarreled among themselves, and the business terminated disastrously to all concerned. Subsequently, and within a few years, the late O. W. Eastou, gave considerable attention to the quicksilver mines of this county, and was so well convinced of their value, that after a thorough inspection, he sought to make arrangements for their development. Some delay occurred, and eventually his sickness and death ended it all. Some interest was revived in the matter by the report in the city a few days since, that a scientific and surveying party had been sent to this county by the Government to examine and report upon the metallurgical and mineral worth of the coal and quicksilver deposits. We have not heen able to verify the truth of the report, and are inclined to think some other locality is to have the benefit of the investigation. The value of the coal deposits needs no Government commission to determine, but it would be a great satisfaction if a thorough examination by competent parties would authoritatively determine either the probable value of the quicksilver deposits as a working proposition, or forever dispel the dreams of those who still fondly cling to the belief that untold wealth lies hidden in the gulches and canyons of old Mount Diablo.—*Contra Costa Gazette.*

MR. E. G. DENNISTON, of the San Francisco Plating Works, after making his yearly trip through the mining regions of California, gives it as his opinion, that Sierra county is, without doubt, the best mining county in the State.

worth to the market. The concentrator operates well, and employs 10 men, having a capacity of 60 tons per day crude ore, concentrating 4 to 8 tons in one. The mine employs 70 men. The figures showing averages in silver and lead for the different years exhibit the changes as depth is obtained. The richest ore is at the bottom, 350 feet on the dip or 200 feet below the surface. A new body of ore has just been struck, on which they have run 30 feet, taking out solid ore 8 inches thick.

The O. K.

William McMeen and R. C. Chambers have a good property in the O. K., being operated by 13 men, Thomas Gibbons being foreman.

The Bullion.

Col. Wall has 115 men employed on the Bullion mine and mill, and is sending off one carload of 165 ounce silver ore, carrying 65 per cent lead, per day. The mine is looking better than ever, and the mill does excellent work, concentrating as high as ten tons into one. The mill is run 12 hours per day, and turns out 3½ tons good ore. The workings of the mine are down 400 feet, the ledge being from two to eight feet, with pay ore five inches to two feet.

Point Lookout.

This property, belonging to Levy, Wexler and M. H. Lipman, is being operated by seven men under Mr. Ripto. The developments consist of a shaft down 15 feet, and a tunnel lately started. The ore averages 150 ounces, and the property promises well.

The Idahoan.

This great property is doing splendidly, working a force of 24 men in the mine. The mill is among the best in the country, and besides concentrating the second-class ore, breaks the first-class, ready for market. The mine has been prospected for 600 feet, getting to a great depth at the inner end of the level, and the quality of the ore improves with depth. Several other properties in this locality are looking well, and in time will become producers.

New River Mines.

There are at present in Eureka the following persons who have just returned from the New river mines: R. P. Stetson, John Black, Mr. Getchell, Mr. Robinson, of Oakland, Jas. McDonald and A. T. Smith. From the last named gentleman we glean the following facts: Mr. Smith was eight days at the mines. He was at the Mountain Boomer claim the day the new bonanza was struck. One of the partners scraped up a double handful of dirt from the decomposed ledge and washed it in a pan, and the result showed $10 in yellow gold. The clean-up this month will return not less than $10,000, and that, too, with only one arastra working three-fourths of a ton of rock per day. The five-stamp mill purchased by Mr. Boles for the American Boy mine arrived at its destination on Thursday. It will be made ready as fast as possible for active work, which will commence in August. The prospect of this mine is very flattering for good results. The whole country is being prospected, and every day ledges are located which show encouraging prospects. The great difficulty at present lies in the fact that those holding claims have no money to develop them, and they want a fortune when they sell out. Consequently little or no work is being done outside of what is necessary to hold claims. As soon as capital takes hold a number of fine claims will be opened up. These mines are situated about 85 miles from Eureka. Some 60 men are now in the camp. No regular mining district has been formed, and in consequence there is no little dispute relative to lines and boundaries, and it is feared serious trouble will follow the loose manner in which claims are designated. The mines lie high upon the Perry Creek Buttes. The snow on the north sides of the hills is yet seven feet deep.—*Humboldt Standard.*

New Ore Mill.—Geo. W. Chick, an expert mining operator, appreciating the necessity of a mining mill for the reduction of ores, has a mill now in operation at Campbell & Co.'s foundry at the corner of First and Main streets. The mill, as well as the rock-breaker, is a Portland invention, and as a representative of this paper was permitted to inspect its working, we can truly say that for its size it surpasses anything of the kind on the coast. Mr. Salmon of the ice works is the inventor of the mill and has spent years of study in bringing it to perfection. Its capacity is ten tons daily, and Mr. Chick informs us that should the demand be larger he will run as many as is needed. Mr. Jones a partner in the foundry, is the inventor of the rock-breaker, pronounced by experts to be perfection itself. A six-horse power engine runs both mill and crusher, the steam being furnished by the foundry. Mr. P. Rigney, the silver plater, on Morrison street, plated the riffles with quicksilver, an idea originating with Mr. Chick. This industry fills a want long needed in Portland, miners heretofore being obliged to send their ores to San Francisco. It is to be hoped that Mr. Chick will be so encouraged as to enter largely into the business. The rock now being reduced came from southern Oregon, from a mine owned by Mr. Chick and partners.—*Portland Standard.*

Useful Information.

A Cork Grinding Machine.

The new material "linoleum" required the invention of a new machine for pulverizing the cork, of which it is chiefly made. This machine is described by the *Manufacturer and Builder* as follows: The machine consists of a series of cast steel disks (18 or 20 in number), with serrated edges like a saw. These disks are alternately seven and nine inches in diameter, and one-half inch in thickness, and are mounted in close contact with each other, side by side upon a shaft, to which they are keyed. Closely adjoining, and fitting in between these disks, with just space enough left between their edges and the periphery of the disks to permit of the feeding of the cork to be reduced, are a series of steel plates with similar serrated eggs. These plates are held firmly in juxtaposition by bolts, which serve also to attach them firmly to the frame of the machine. The toothed disks are rotated at about 180 revolutions per minute, and the cork is reduced by the machine to the size of a pea. These fragments are further reduced to powder by ordinary horizontal mills resembling those used for grinding corn. From the millstones the cork powder is carried by a screw elevator to a sieve, by which the coarse and fine fragments are separated into several grades for the production of several qualities of linoleum. If any of the material is too coarse, it is returned to the mill. The very fine powder is treated with the suitable mixture of oxidized linseed oil, and after the product is finished, makes a floor cloth that is susceptible of a very high finish; the coarser material, on the other hand, makes a more elastic linoleum.

Tanning Linen.—A Belgian inventor, M. Piron, has invented a method of rendering cellulose tissues impermeable and very durable, without injuring their flexibility, and without much increasing their weight. By examining the bandages of the Egyptian mummies he inferred that the best preservatives would be found in the vegetable kingdom and he has given preference to the green tar of birch bark, which furnishes the perfume of Russia leather. The tar forms, with alcohol, a solution of great fluidity; but when once dried it becomes resinous and resists the solvent power of alcohol. It can be combined with the most brilliant colors. These qualities enable it to penetrate the capillary vessels of tissues, covering them with a varnish of great elasticity, which resists the corrosive action of acids, sea water and changes of temperature. The density is very small, so that the tissues are made impermeable with a slight increase of weight. The prepared stuffs can be folded without scaling. The aromatic odor drives away insects. Microscopic vegetation cannot grow, because neither air nor water can penetrate into the interior of the fibres. The invention can be applied to all vegetable tissues, such as sail cloths, cordage, awnings, curtains, &c.

How Glass Beads are Made.—Glass beads are made by drawing the glass into small tubes, and breaking the tubes into suitable lengths for forming the beads. The material is then placed upon a flat plate like a frying pan, which is heated just hot enough to allow the glass to draw the sharp edges into a round; at the same time the plate or pan is gently vibrated, so as to prevent cohesion of the softened beads. A cylinder is also used something like a coffee roaster on a small scale. The cylinder can be made of cast iron quite thin. Faceted beads are made by pressing the glass in small moulds that have sharp edges and a punch, so that the eye is punched and the bead faceted at one operation, using small rods of glass heated in a muffle furnace. The manufacture is mostly confined to Birmingham, in England, and Venice.

Wood Carpeting.—What is described as a wood carpet has lately been patented by Herren Kuny & Marx, of Munich. It consists of prepared wood-fibre, felted by the aid of oxidized linseed-oil and coloring matter on to a jute fabric, the back of which latter is covered with a coat of varnish. The material thus obtained is said to have a pleasing appearance, can be easily cleaned and repaired, is warm, noiseless, and can be taken up like carpets and quickly relaid on a change of residence. The surface can be produced either flat or with designs in very slight relief. The coloring is homogeneous throughout. As will be seen from the above description, the wood carpet is in some respects not unlike our linoleum. The price is said to be, however, much lower, while durability is also claimed for the new material.—*London Furniture Gazette.*

Phosphorous Paste.—A phosphorous paste that will keep a long time may be made by the following process: Shake nine parts of phosphorus in ninety parts of warm syrup, and pour the still warm mixture into a pan in which ninety parts of wheat flour have been previously put. Agitate rapidly, and add sixty parts ivory black, sixty parts water, and one hundred and twenty lard.

Whalebone Brushes.—In buying a brush, the buyer is often offered one for, say fifty cents, and another to the unpractical eye, exactly like the first, but for which he is charged one dollar. Now, where is the difference? The New York *Sun* answers as follows: "One is made from real bristles, and the other from whalebone. They look just alike, but, of course, the bristles are better. Whalebone has been used to make brushes for some time. It is divided up into shreds by machinery. It doesn't make a bad brush."

To Destroy Red Ants.—Grease a plate with lard, and set it where ants congregate; place a few bits of wood so that the ants can climb on the plate easily; they will forsake any food for lard; when the plate is well covered with them, turn it over a hot fire of coals; they will drop into the fire, and you can then reset the plate for another catch. A few repetitions will clean them out.

How to Wash Old Flannels.—When flannel has become yellowed by age, in order to whiten it, dissolve a pound and a half of soap in six gallons of water, and add to it one tablespoonful of spirits of ammonia. Place the flannel in the water, stir it rapidly around for a short time, and rinse it up and down, then take it out and rinse it in pure water.

Golden Streets.—The well-known French electrician, Mr. Louis Maiche, has found there is gold to be obtained from the quartz, with which the streets of Paris are paved. He has obtained small quantities of gold from the sentinel, but not in sufficient quantity to warrant the tearing up of the road beds for mining purposes.

Oil-cloth may be improved in appearance by rubbing it with a mixture of one-half ounce of beeswax in a saucerful of turpentine. After being applied it must be well rubbed with a dry cloth, otherwise the floor will be quite slippery.

Carriages Made from Paper Pulp.—A Dresden house makes children's carriages out of pulp. Watch cases are made from black celluloid. Japanese papers for clearing the skin are also in the market.

On the Pennsylvania Railway the average consumption of fuel for passenger trains is 56 pounds per train mile.

Good Health.

Heart Disease.

There are probably many among those who will read this article, who believe themselves victims of heart disease. If a repetition of the statement we have repeatedly made, that examinations after death have shown that only one person in twenty of those who were supposed to have died of heart disease, had any disease whatever of that organ, will serve to allay the fears of a single *malade imaginaire*, we shall feel amply rewarded for the trouble of writing it. When we consider that a large portion of the adult population of this country suffers more or less from dyspepsia, and that this disease simulates heart trouble so closely as in many cases to require a careful examination by a physician to determine the question, we can not wonder at the supposed prevalence of a disease that is comparatively rare. But still there are cases of real heart disease, that with proper care cause no marked inconvenience or suffering, and where the patients live to old age or die of other maladies. Again, there are victims of the disease to whom death comes as a welcome relief.

Sometimes an hereditary tendency to the malady exists, as in consumption and other diseases; but in the light of medical knowledge at the present time it could hardly be regarded as a fatality. Careful living usually overcomes such tendencies. A prominent man doing business in New York, but residing in the suburbs, having been delayed in his office a few minutes longer than usual, ran in order to be in time for his regular train; the following day he died of heart disease. Had he given the matter a thought, it probably would have occurred to him that the effect might very naturally follow the cause. A person past middle age, and unaccustomed to such vigorous exercise, can not hurry the circulation of the blood and the respiration with impunity.

Nothing is more dangerous than irregular and violent exercise for persons unaccustomed to it. Students and others of sedentary habits who exercise in gymnasiums, can hardly restrain themselves from efforts to excel; and thus bring injuries upon themselves that impair health and shorten life. As generally conducted, gymnasiums are responsible for a great amount of evil. If any special muscles are unduly developed, the development is at the expense of other muscles, and thus the equilibrium between the muscles of the body is deranged or destroyed. The heart is a muscle, and its development is a *disease* to which athletes and gymnasts are peculiarly liable.

We do not wish to be understood as saying that heart disease never comes from dyspepsia. Blood is made of food taken into the stomach. If not properly digested, the quality of the blood is poor, the circulation is impaired, and the action of the heart is irregular. This would lead to disease, eventually, did not the stomach rebel and positively enforce better treatment, and that is the reason so few dyspeptics suffer from actual disease of the heart; although there may be great functional disturbance. It is a trite saying "that a gentleman is never in a hurry." He is supposed to do all things with dignity and deliberation. He never runs to catch a train, or jumps over the ferry-boat gates to get ashore first. He is never in haste to reach the dining-room at the first tap of the bell, nor in a hurry to leave when he gets there. If he were generally adopted as a model, there would be fewer cases of dyspepsia. —*Journal of Health.*

How Much to Eat.—It is utterly impossible to prescribe the quantity of food appropriate to a person; he must ascertain that for himself. This is not very difficult, for if one eat lightly, say at breakfast, and note the time he can go without feeling a want of more food, he will, after a few experiments, ascertain the amount of food requisite for a day. Let one take some bread and milk, or porridge or what not, a moderate quantity, at breakfast, and it will serve him probably for three or four hours. Of course the time during which he will feel no special desire for refreshing the stomach will be dependent upon the work in which he is engaged, a given amount of food going further in manual exertion than in brain work. When it is ascertained how much is suitable, care should be taken not to eat more than that. It is better to reduce the quantity than to add to it; it is better to leave the table with a sense of want than with the sense of repletion. Rest is as essential to the stomach and other organs of digestion and assimilation as it is to the limbs. Overwork of the stomach induces dyspepsia, whereas an insufficient amount for the needs of the body will not tell very soon upon the constitution; that is to say, if one eats his daily meals regularly, but doesn't eat quite enough at a time, nature will more readily adapt herself to the shortened allowance than she can to a trifling excess of the proper regimen. *Science of Health.*

Overcrowding the Principal Cause of Diphtheria.—Dr. T. J. Hutton has, within the past three years, treated 64 cases of diphtheria, occurring in Minnesota, and says in the *Medical Record:* These cases were all in comparatively new houses, in a belt of country where white men never lived before, so that the soil contained no sewage and had no accumulation of surface filth. Diphtheria had never before been there, and could not have been brought by visitors; it was of a malignant type, and some families lost five or six members each. All of the cases were included in 17 rural outbreaks, 3 of which were in summer and 14 in winter, and each house attacked was small and greatly crowded. Many of the winter outbreaks happened when the temperature was 30° to 40° F. below zero, which would have been death to all ordinary surface germs, and in one instance the thermometer registered 60 below, when the surface of the earth and all bodies of water were frozen solid.

The Bite of a Mad Dog: not Always Fatal.—The bite of a mad dog, it would appear, is not so fatal as is generally supposed. A report upon the subject for the Department of the Seine, issued by the Paris Prefecture of Police for the past three years, shows that of 156 persons bitten by rabid dogs in 1881, 80 died; in 1882, 9 out of 67 bitten died; and in 1883, 5 only out of 45. With regard to the treatment of the bite of a rabid animal, the experience of the French doctors shows that the only remedy which can be depended upon to destroy the virus is the prompt application to the wound of cautery by red-hot iron. Twenty persons died of hydrophobia in the Department of the Seine in 1881, 9 in 1882, and 4 in 1883, as far as the official returns show. The decreasing number of deaths from this cause is attributed to the stricter measures adopted with regard to owner-less dogs.

The Pulse of Smokers.—From experiments made upon the pulse and temperature as affected by smoking, it has been found that the rate of both is increased. Let the average temperature of non-smokers be represented by 1,000, then that of moderate smokers would be 1,008; and while the heart of the former class was making 1,000 beats, in the latter there would be 1,180 in the same space of time. This quickening of the action of the heart is considered a dangerous symptom.

Covering the Head.—In a paper read before the Edinburgh Health Society, Dr. Almond referred to the custom of having the head covered out of doors and uncovered within doors as very injurious, on account of its making people so sensitive to draughts of air as to cause them to take cold. Boys, he said, who went bare-headed out of doors could stand a greater amount of ventilation in school rooms and sleeping rooms than those who wore head coverings.

Crushed Ice for Burns.—The value of crushed ice as a dressing for burns and scalds, first pointed out by Sir James Earle, is confirmed by Dr. Richardson (*Asclepiad*, 164). The ice, after being reduced by crushing or scraping to a fine state of division as dry as possible, is mixed with fresh lard into a paste, which is placed in a thin cambric bag and laid upon the burn. This is said to banish all pain until the mixture has so far melted that a fresh dressing is necessary.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

CANNON BALL MILL.—Amador *Dispatch*, August 9: Mr. I. N. DeWitt has got his new cannon ball quartz mill about ready to commence crushing rock on his mine in Murphy's gulch. The rock looks well and is in a good locality. Mr. J. W. Petty showed us several pieces of very rich rock taken from his mine near Slabtown last week. The precious metal was visible to the naked eye in very encouraging quantities.

El Dorado.

CRUSHING.—Georgetown *Gazette*, August 9: The Revenge quartz mill near Greenwood is now engaged in crushing a lot of 100 tons of ore from the Bell mine in Garden Valley district. There is no doubt about this ore paying handsomely, as we understand Supt. Dixon is crushing the rock for one half he takes out of it. Work of development in the Revenge continues steadily, and another crushing will be made after the Bell ore is crushed. We hear of others who are about to have ore tested by this mill.

Inyo.

FREEBORN CANYON MILL.—Inyo *Independent*, August 8: Some twelve or fourteen men arrived in town during the week en route for Freeborn Canyon, to work for M. G. Nixon on the mines just purchased by the latter. The number of teams and pack mules that were employed to take the supplies over lead us to think Mr. Nixon means business, and we have no doubt that he will soon be repaid for his immense outlay, as there is considerable ore now ready to be packed and milled.

POLITA MINE.—Tom Luther was in town on Tuesday last, and reported everything working smoothly at the Hawley mill, which is being put in good shape. By next Monday the side track will be finished to the mill, which will start up at once. Messrs. Irwin & Co. intend to make the Polita mine a success, and are the right men in the right place. We hear that George Storey has arrived at Bishop Creek to take charge of the mill.

Modoc.

HAYDEN HILL.—Cor. Adin *Argus*: A. P. Ritchie has disposed of his interest in the "Don't Care" mine. The "Juniper" will have to look to her "laurels," as another mine equals, if not surpasses, her in richness. G. F. Hoes has had his new mill in operation, but owing to some breakage in machinery has not yet proved its success. He has had the old "Brush Hill" mill again put in operation, to assist in the reduction of his large quantity of ore. Preston & Co. have their new arastra completed and in operation. It is said to work well.

Mono.

HOMER DISTRICT.—*Mining Index*, August 9: The Gorilla mine has been steadily improving in appearance and value for the past four or five weeks, until now it stands as one of the best mines in the district. The only drawback is the lack of facilities for the reduction of ore in quantity, the capacity of the present reduction works being but five or six tons per day. One of Hill's Triumph ore mills, with a capacity of twelve tons per day, has been ordered, and will be shipped next week. This will help out; but, with a few additional men, the mine could furnish fifty to sixty tons of ore per day for an indefinite period of time. The Bryant mine continues to turn out very rich ore, with an abundance "of the same sort" still in sight, and from this high-grade ore the little two-stamp Butterfield mill is turning out almost as much bullion weekly as more pretentious reduction works. As yet we are not at liberty to state the yield per ton, nor the aggregate yield for the season or per month, but hope soon to get permission to give both, as the former would seem almost incredible without the latter. The May Lundy is running full-handed, and the bullion shipments are regular and of the usual value. The new tunnel will tap the vein in the Lake View within a short time, when a rich development may be expected. The Hearne arastra has been started up on ore from the Clifton mine, and those familiar with the ore and the past history of the mine confidently expect a handsome yield.

JORDAN DISTRICT.—The Virginia Creek Hydraulic M. Co. is sluicing out placer gold by the pound from its diggings near old Monoville. This is undoubtedly the richest hydraulic diggings ever opened in the State. The present breast is very broad, the pay gravel being about five ft in thickness, with from fifteen to twenty inches next the bedrock that is literally "lousy" with coarse gold. Water is abundant, and when the bedrock is cleared of gravel and earth it is found to be yellow with gold. The whole width of the tunnel being driven in the ledge in the Olsen claim, at the head of Callihan creek, is still in fine ore, giving assays of about $150 in gold and from $3 to $4 in silver per ton. Near by is the Olsen No. 2, commonly called the "Silver Ledge," with a low-grade ore vein fully eight ft in thickness, gold and silver being about equally divided in value. Nothing yet is definitely known as to the intentions of the Detroit Copper Company.

TIOGA DISTRICT.—Considerable activity now prevails in the south end of Tioga district. R. A. Sawyer has resumed work on the Mary B, the Yosemite and the Deer Lodge, on Mount Gibbs plateau, and George M. Lee is working the Silver Prince, the first north extension of the Ella Bloss, on the southern slope of the same mountain, near the head of Bloody canyon, and the Garibaldi, on the plateau. Gus Cordes is working the Dutchman, on the southwest slope of Mount Gibbs, and has a fine prospect. Sonora parties have men engaged in working claims on Tioga Hill, on portions of the Sheepherder and other lodes. Work has not yet been resumed in the Great Sierra tunnel, but the wagon road is being put in order, and other preparations made which clearly point to the resumption of work at an early day. Orlando Fuller and Andrew Thompson are still sinking in the Lucky Friday.

PRESCOTT DISTRICT.—L. W. DeChambeau and Wm. D. Ray have commenced work on their location on the big ledge near the Mount Lyell glacier. Lord Horace Pullen went over to Mount Lyell during the week to look after his Lucky Saturday claim. Fred Schwartz is driving a short tunnel to strike the ledge in the Big Bonanza at a depth of fifty ft, being encouraged by assays of $375 (silver) from the croppings. Schwartz and Tommy Albright are also working the Hardscrabble, on the Queen of the West lode, east of Mount Lyell. Tom Jackson and Col. Burroughs are working some claims in Parker canyon, and are daily expecting the arrival of some Arizona capitalists.

Nevada.

RIVER MINING.—Grass Valley *Union*, August 8: River mining is not altogether a thing of the past, but the operations are almost entirely conducted by Chinese companies, of which there are a number engaged this season on the Yubas. And from the fact that some of these companies have been working the same locations for several years past the presumption is that they have ground that pays for the expense and labor of mining the streams and putting in the requisite flumes and dams.

THE MCCUTCHAN MINE.—Nevada *Transcript*, August 8: Robert Curnow and John Spry have leased the McCutchan mine on Canada Hill for one year. Work will be immediately commenced, and after clearing out the drain tunnel a crushing of rock will be taken out. Mr. Curnow, who had charge of the mine heretofore, is confident that the mine can be made to pay well.

OPENING THE MILLER LEDGE.—The Thurston brothers, who have been mining at Cherokee recently, will this week begin the systematic development of the Miller ledge, situated below the Baltic, which latter is not far from Graniteville. They will take up there, from Cherokee, their Cannon Ball quartz mill to crush the ore, of which they already have out about 250 tons. A small lot of the average quartz was milled lately and paid $18 a ton. The Miller ledge was partially opened up by Captain Miller, when he died, and it has, since his death and until now, remained idle. Those acquainted with its history say it is a very promising claim.

DISPLAY OF BULLION.—Thursday's and Yesterday's bullion from neighboring mines, amounting in all to about $15,000, were on exhibition at the Citizen's Bank yesterday afternoon, attracting the attention of a good many of the people from abroad who were in town. One bar worth $9,000 was especially admired.

A BIG LOT OF GOLD.—So many pounds of gold bars, that it required the united strength of two men to carry them, were sent to San Francisco yesterday afternoon through Wells, Fargo & Co.'s office at this city. Some of that wealth was from quartz and some of it from gravel (drift, of course) mines. It is imperishable, unlike the products of the valley ranchers and manufacturers who are trying to stop our people from taking more of it out the ground, but can't. Nevada county can be easily made to yield enough out of it in one year to buy every acre of slickens land from the summit to the sea.

Placer.

LUCKY S.—Greenville *Bulletin*, August 6: Mr. John Hardgrave of Taylorville was in town on Monday concluding a contract with the Greenville Iron Works for a quartz mill to be placed on the Lucky S mine. Work on the mill will commence immediately and will be pushed till the completion of the work. G. W. Aylesworth of this place will have charge of the carpentering to be done. Only five stamps will be put in at present but the mill will be so constructed as to enable the company to add five when they wish to do so. The ditch has been completed and the water turned in. There are about 100 inches of water. The outlook is good for a successful run. The New York mill has been leased by T. F. Emmons for the owners of the Central Ledge, which is on ground adjoining the New York mine. The prospects at the Forest King are quite good.

Plumas.

HOPKINS CREEK QUARTZ.—Plumas *National*, August 9: On Monday last we received a call from Cap Donahue and Mr. McDaniel, gentlemen who are interested in the rich quartz mines recently discovered on Hopkins and Poormans creek. The Captain had some fine specimens of rock, and also some seven or eight ounces of almost pure gold which were taken from the American claim last week. Some of the pieces weighed an ounce or two. He tells us that two men at work in the ledge picked up over 14 ounces of this gold last week. The ledge is at least 30 ft in width, fine looking quartz, and the owners are sanguine that they have one of the very best mines in the country. A new location on Poormans creek, named the Walkeresa, is thought to be a splendid ledge. It is a 12-foot vein. The American Co. sent a specimen for the cabinet which, though not large, is a beauty and shows well. The gentlemen tell us that many locations have been made and the indications are that a very lively and flourishing quartz camp will be in full blast there in a short time. The owners of the American mine are well able to make all necessary improvements, and it is thought that a mill will soon be put up. Hopkins and Poormans creeks were famously rich in the years gone by, and the ledges now being opened undoubtedly furnished the gold which made them so.

ANOTHER QUARTZ MILL.—Sierra *Leader*: J. C. Black, a prominent attorney of San Jose, passed through the valley Wednesday. He went to Mohawk where, with his brother and other parties, he is interested in some mining claims. He states that it is the intention of the company to erect a mill on the ground at once.

San Bernardino.

THE BONANZA KING.—Cor. Calico *Print*, August 8: This camp is one of the best and most productive of any in this section, and I will give you an item correct, as taken from the records of the Co. The Bonanza King Consolidated Mining Co's mill, a ten-stamp dry crusher, has now run on ore, from the mines of the Bonanza King Con. Mining Co. for a period of seventeen months. During that time there was crushed and reduced at the mill 12195 tons yielding in bullion $902,520. The mine continues to look well throughout; the yield at present is about the same. The Company shipped July 24th $8,000, to-day $11,150, and will forward on the 10th about $13,000 more. The battery assays average from $70 to $90. The percentage saved from the fire assay by amalgamation, without roasting, is very high, from 85 to 93 per cent. This is a showing that any company might be proud of. The other mining interests in and about the camp are doing well and promise to make favorable showings for themselves ere long.

Siskiyou.

PICK AND PAN.—Yreka *Union*, August 7: Mr. Geo. C. Spooner, an expert miner who, in company with others, have been operating the Summerville hydraulic claim, on the south fork of Salmon, informs us that the mine has yielded satisfactory returns for the short length of time the mine was worked. The claim is said to be the best equipped in the northern country, but the water supply is not sufficient to admit of long runs. The Co. will probably construct new ditches to tap the south fork of Salmon river and a branch known as Little South Fork, which will give an abundance of water for all purposes. A new saw mill will soon be erected to take the place of the one destroyed by fire last fall. Mr. R. H. Campbell, of Quartz valley, has finished cleaning up, and the yield fell but little short of $60,000. In the McConnell claim on the Klamath river rich pay is being realized; the electric lights have been attached to a new dynamo generator, and are now working satisfactorily. Of the many mines that have closed down for the season only one is reported as not paying a profit over running expenses. Mr. Pyle paid a visit to his mine on Deadwood, yesterday, and appears well satisfied with the outlook. He brought in several pieces of very rich rock. The Crooker boys have started their arastra on Deadwood.

Shasta.

ROUND MOUNTAIN.—Cor. Shasta *Union*, August 9: Our mining interests in this district are at present almost entirely neglected; some little prospecting is going on. Mr. Morley has a good gold prospect in his claim, and has done considerable tunnel and shaft work. At the Afterthought everything looks dreary, no one at the mine or mill to take care of property that has cost a large amount of money to put in shape, which was abandoned last September. Parties passing by will appropriate and pack off anything that they think they need, and so article after article has disappeared, and many of considerable value. The main building is of itself a fine structure for a ten stamp mill. Mr. Stewart, the last Superintendent of the Afterthought, came nearer making the mine pay than anyone before him, and says that with the outlay of a few thousand dollars in erecting a copper mill, that he can soon make the claim pay dividends, for he says that it is more of a copper mine than anything else, and to work for the copper first and then for other valuables, will make good returns, but to work all together the cost is too great.

Trinity.

RICH QUARTZ.—Trinity *Journal*, August 9: John Clifford came up from New River this week and exhibits the richest quartz specimens ever found in this county. The prospects in New River District are said to be excellent, there being 15 or 20 ledges.

DEADWOOD is rather dry now, as the water supply is too limited for running the arastras. Most of the mines are being worked and developed, and reports say that good rock is being taken out.

ALL READY.—We erred in saying that McDonald & Franck had started their five-stamp mill on Deadwood. The mill, however, was within a day or two of completion, and we were informed that they would probably make a trial on Tuesday of this week. In all its appointments the mill is most complete and of the best, and judging by the quality of rock on the platform, will produce more than any mill or other crusher in the county.

PAID WELL.—We met Supt. John Yule, of the Buckeye Company, for only a few moments on Monday last, but long enough to learn that the season's work had been successful, and that he was highly elated over results. The immense body of auriferous gravel owned by this company should be made to yield millions of dollars, and will do so if worked on an extensive scale.

NO MORE WORK.—Mr. E. M. Benjamin, Superintendent of the Hayes Red Hill Gold Mining operations, writes us that he now has 72 men employed on the works, and does not desire to employ any more.

R. N. DAVIDSON is doing good work with his Cannon Ball Mill on Deadwood, running on very hard rock from the Vermont Mine. We learn that this rock is paying very well.

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, August 9: The west crosscut on the 2800 level was yesterday out 14 feet. It has been all the way in quartz, which shows bunches of ore. They have yet some distance to go to reach the point where the principal deposit of ore should be found. Regular shipments of about 500 tons of ore continue to be made from the the ore body on the 300 level. Since last report additional returns of $12,000 have been received on July account. Last week, it will be remembered, there was an additional return of 4,000 ounces of crude bullion.

GOULD AND CURRY.—The joint Best and Belcher west drift on the 2500 level is now being advanced at the rate of about 60 feet per week. The north drift from the 825 station of the Bonner shaft is making good progress in ground that works well. When out a proper distance, crosscuts will be run from this drift to explore 2 large area of ground that has not heretofore been worked.

SIERRA NEVADA.—West crosscut No. 3 on the 3100 level is showing a strong streak of ore that assays about $20 per ton. This ore deposit dips to the east at an angle of forty-five degrees, and now fills the face of the crosscut. On the 3200 level the joint Ophir, Mexican and Union Consolidated winze has been sunk and timbered eight feet.

CHOLLAR.—The main south drift on the 2800 level, which has been advanced at the rate of over 60 feet per week, is now making less progress, owing to a recent flow of hot water from the face. The material is now largely composed of quartz.

OPHIR.—On the 250 level some paying ore is still being taken from the fillings of old drifts. On the 500 level the west drift is making about 60 feet per week.

ALTA.—The west drift on the 2150 level is being advanced at the rate of over 70 feet a week, and is in very favorable ground. The water is draining out considerably in the east drift on this level.

YELLOW JACKET.—A good deal of low-grade ore is still being extracted and sent to the mills. While the ore already opened up is being extracted, a considerable amount of work is doing in the way of running exploring drifts.

ANDES.—The winze is fast nearing the vein, where it is expected some paying ore will be found. The north drift is in quartz showing occasional bunches of low-grade ore.

CROWN POINT.—About the usual quantity and quality of ore is being mined and sent to the mills. A considerable amount of ore is being opened up by the prospecting drifts.

ALPHA.—The north drift is being advanced in quartz of a promising character, which yields low assays. The east crosscut has passed into porphyry.

UTAH.—The southeast drift on the 1950 level has made the usual progress during the week, and is still in vein porphyry with seams of clay.

CONSOLIDATED VIRGINIA.—The diamond drill shows much wet ground on the 2900 level. The water is very hot, and drifting on the level will be slow work.

Esmeralda District.

HUMBOLDT MINE.—Bodie *Free Press*, August 6: A private letter states that Gov. Blasdel let the contract on Monday last for sinking the new double compartment shaft on the Humboldt mine at Aurora. It will be sunk 100 feet at $10 per foot, to be completed in 30 days and will be used for the new hoisting works. These figures are as reported on the street. Six men started in on the work yesterday.

Arabia District.

STARTED UP.—Cor. *Silver State*, August 8: Superintendent Williams, of the Bernice mill, arrived from Bernice Wednesday. He says the mill had been thoroughly repaired, and was started up on the 15th of July. A partial clean-up was made after a run of 14 days with five stamps, and the result was $5,000 worth of bullion. There are fifty men at work in the camp, and the number will be doubled before snow flies. The miners are looking well, and there are large quantities of ore in sight. Application has been made to Wells, Fargo & Co. to establish an express office in the place.

Columbia District.

POLARIS.—Tuscarora *Times-Review*, August 8: Active operations are being prosecuted at the Polaris mine at Columbia. A new whim has been erected which is working finely and which is abundantly able to do all of the hoisting for a hundred feet below the present depth of the incline. A new track has been laid to the bottom of the incline, which is down 130 feet. Sinking and drifting, both in ore, have been resumed and in a short time there will be a considerable amount on the dump ready to be taken to the mill. The ledge in the face of the drift at the 100-foot level is fully six feet in width and the entire body will average sixty dollars to the ton. The incline will be sunk to the depth of 200 feet when another level will be opened out. A considerable addition will be made to the working force in the course of a few days.

Highland District.

MENDHA MINE.—Pioche *Record*, August 8: This mine, at Highland, continues to hold out its own. The ore body on the 115-foot level continues to hold out strong, pitching to the southwest. The ore in the drift, at the face was eight feet wide. The bottom of the drift at this point, was all ore. It had been sunk on for six feet, and continued all in ore. There is now being run a drift from the shaft on the 160-foot level to tap the ore going down. The drift is now in 130 feet, and foreman McQuaig expects to tap the ore in about 40 feet further. Iron stains have just commenced coming in the face of the drift. The usual amount of ore is being extracted from this mine daily and shipped to the furnace, and the grade of the ore holds about the same as has been published before.

Columbus District.

MOUNT DIABLO.—*True Fissure*, August 9: The east drift on the fifth level has been driven 12 ft during the week, and has now 71 ft to go to reach the incline. The incline is now 257 ft below the third level, and has 12 ft more to go to be as low as the fifth level. The east drift on the fourth level is in 101 ft, and a drift has been started west from winze No. 3 to meet this drift. There are 115 ft yet to drive. The west drift on the fourth level has advanced 8 ft during the week, and the face shows a little low-grade ore. The west intermediate, between the second and third levels, is in 138 ft, and shows a little low-grade ore. In the intermediate, between the first and second levels, the east drift shows a narrow seam of $60 ore. A small amount of ore of fair grade is being taken from the workings above the Mount Diablo adit.

Pennsylvania District.

NO BENEFIT.—Pioche *Record*, August 8: The chances are that the Klingersmith mining property of Pennsylvania district will never change hands. The owners want too big a price for the property. No matter what amount will be offered for the mine, always some one of the owners holds off with the hope that he may get four bits more for his interest. No matter how good a mine may be, if it lies idle for years, as this property has done, it is of no benefit to its owners, nor the locality that it is in.

Osceola District.

VERY QUIET.—Pioche *Record*, August 8: E. Howell, after a ten days' trip, has just returned from Osceola, and reports things as very quiet over in that section, the water having nearly given out and but little doing on the placers. The 20-stamp mill of the Osceola Company is running on ore from the Monroe & Lytton and doing good work, taking out considerable gold bullion. Mr. Howell's trip was for the purpose of examining the Verde mine for San Francisco parties, the property of Akie and Felsenthal. He speaks quite favorably of it and was well pleased with the large amount of pay rock in sight, the ledge being stripped for 250 ft or more and showing up a strong four-foot vein of ore the entire distance. He puts the amount in sight at $20,000, and thinks when depth is attained will prove a valuable mine. The owners are taking out ore for a crushing at the Osceola mill, and will make a shipment next week of 60 tons, which will go a long ways in showing up the true merit of the property.

Taylor District.

PROSPEROUS.—Cor. Eureka *Sentinel*, August 9: Our mines are yielding constantly their ordinary quantity of ore. The quartz teams are going continuously and quiet prosperity reigns in our little camp.

Amador District.

PRODUCING GOOD ORE.—*Silver Star*, August 11: Nick Frayer who arrived yesterday from the Paradise mines, gives glowing accounts of the outlook in the district. He says every mine that is being worked looks well. The Paradise Valley is taking out extraordinarily rich ore in the Wild Goose. The Bullion, which has been leased by Harry Warren, is showing up rich ore, and considerable of it. The Julia mine, owned by Henderson, Patterson and Myrick Carrel, is developing finely. There are two feet of rich ore in the vein. Vance Nelson has purchased an interest in the Rattler, and he and Mr. Brannan, one of the old owners of the mine, are taking out good ore. They have cut the lead in the tunnel at the depth of about 100 feet and find the vein very rich at that depth. There are ten or twelve men at work on the foundation of the Live Yankee mill, and two millwrights are putting in the machinery. The prospects throughout the district are first-class. The Juha, which is a new discovery, shows as well as any prospect ever found in the district. Good judges say the ore which is being taken out of the lead will work at least $500 per ton.

Belmont District.

BELMONT.—*Courier*, August 9: The 200 foot level south is now out from station 406 feet in very hard rock; just struck in face a fine streak of ore. Ledge in stope No. 1 is 5 feet thick, mostly good ore. Stopes 2, 3 and 4 unchanged. Under stopes 1 and 2 holding their width and yielding fine ore, black metal and chlorides. Battery and furnaces running splendidly. Average chlorinations, 95 per cent. Will commence leaching to-morrow. Everything about mine and mill in excellent conditon.

ARIZONA.

CONCENTRATOR.—Prescott *Courier*, August 9: Edward M. Clark has a good mill, concentrator, etc., on Groom Creek, and announces his readiness to work ores for the miners. B. T. Riggs, who recently visited the Del Pasco, tells us that the lessees of the mill do their own work and are making money. They are mining in the Pine Tree lode. This is "clean-up" day at the Kimball mill. Messrs. Bagley and Marlow are developing a promising mica mine 2½ miles from Williamson Valley. The vein is large and so are leaves of mica. Messrs. Burton and Murphy have leased one of Major Dake's Walker District mines. They expect to take out silver worth $300 per ton. Some 20 miners are at work in the Lane mine, the ore of which is being worked at the Tuscumbia mill. The St. Louis Yavapai Company, of Humbug district, think their mill will be running in about thirty days.

NACOSARI.—Tombstone *Epitaph*, August 8: All indications point to Nacosari as the coming new camp, about which the boom is to center. The operations of the New Jersey and Sonora company have been so successful that other companies have been organized with equally good prospects, and the time is not far distant when that camp will be the scene of very extensive operations. New strikes are constantly reported; placer diggings have been discovered a few miles west, and gold is being brought in every day. The country is a natural tributary to Tombstone, which has already been largely the gainer by the trade of that section. A weekly stage line has been put on from Tombstone, and communication between the two places is now rapid and easy. The new camp is delightfully situated in the foot-hills of the Sierra Madres, which have been in the past, and will continue to be in the future, the great mineral producing mountains of the world. The detached spurs of mountains in eastern Arizona are but the continuation of that range, and form the connecting link between the Rockies and the mother mountains. As Humboldt predicted, here lie the great mineral deposits of the continent, and every day is proving the truth of the prediction.

THE OLD STAND-BY.—Mohave County *Miner*, August 6: This mine is on the dividing ridge between Stockton and Cerbat, and is now owned by J. J. Hyde. It is some ten years since this claim was located, and more or less work has been done on it ever since, but no shipments of ore were ever made from it until the present proprietor took hold of it, and in February last shipped a carload to San Francisco which sampled 25 ounces in silver and 45 per cent lead. A tunnel is now being run on the ledge and is now in about 50 ft, showing about seven inches of solid galena in the face. The Black and Tan is another old location with a good reputation for high-grade ore, and is now owned by Tubman Ayres of Cerbat. The developments of this claim consist of two tunnels run in on the ledge at opposite sides of the gulch, one being about 80 ft and the other about 340 ft long. Mr. Ayres has recently leased this valuable property to Messrs. Williams and McCue, two good hard-working miners from Nevada who bid fair to make some money out of it. When we take in consideration the fact that ore from this mine is worth from $150 to $600 per ton, it will be seen that four or five inches of it means big money. The streak shows every indication of still widening out and appears to be similar in appearance and equally as rich as the streak in the face of the tunnel below, which is about five inches wide, and will mill about $400 to the ton. The Sixty-three is a mine as well, if not better, known than any in the county, and is now owned by Mr. Canty. The main shaft is down about 150 ft, but the work of sinking had to be discontinued on account of water. Most of the upper workings have been stoped out by former owners, who realized about $150,000 from them. Mr. Canty has recently commenced work on this mine and has several men engaged in cleaning out the old tunnels and stopes, which require considerable timbering. In the old workings considerable good ore remains which will mill from $60 to $100 and which would not pay to take out in the old days when the mill took pretty nearly everything below $150. The Dictionary is a mine that is now attracting about as much attention as any in Wallapai district. It lies in the Cedars at the foot of Stockton Hill, and was bought by the present proprietors, Messrs. Moore and Labaree, for the insignificant sum of $85, some few months ago. They little realized at that time that they had bought a bonanza. Messrs. Moore and Labaree are two as good miners as will be found in any district, as a glance at their work will show. They commenced operations by starting a tunnel on the opposite side of the hill to where the former owners worked, and expect to tap the ledge in about 200 ft. This tunnel is now in nearly 180 ft, and is being driven in at the rate of about a foot a day. When in about 80 ft a ledge of good-looking ore was cut, which was about five inches wide and assayed some $250. The existence of this ledge had never been dreamed of, as no signs of it exist on the surface. Levels were at once run on the new discovery, the north one being now in about 80 ft and the south one about 40 ft. In running these levels some 20 or 30 tons of ore were taken out which yielded from 150 to 400 ounces in silver. The north level is now being stoped out to the surface, three men being engaged in this work alone. In the stope the ore streak has widened out to about nine inches while the character of the ore is considerably improved. The day we were in the stope there must have been $10,000 of ore already stripped and ready for taking down.

COLORADO.

NOTES.—Georgetown *Courier*, August 9: A good deal of prospecting is under way up Mill creek this season. A great deal of prospecting is being done in Daily and Atlantic districts. A carload of ore was shipped from the Albro mine, at Dumont, on Saturday last. Farris & Co.'s lease on the Joe Reynolds turned out over sixty tons of ore last month. A mill run of 1,214 pounds of ore from Lucas & Co.'s lease on the Telephone returned $465.20. The Brannagan milled some 800-ounce ore a few days since. The second class milled 180 ounces. Several inches of $1,000-ore has been encountered by the lessees on the Owosko lode, Brown mountain. During the month of July the Barrett and Fletcher gold mill at Empire crushed 65 cords, or about 400 tons of ore. A mill run from the Swamp Angel lode, worked by Rockwell & Co., gave 96 ounces in silver and $17 in gold to the ton. The output of ore from the Mendota mine on Sherman mountain for the month of July was 90 tons, 1,110 lbs.; value $6,635.35. The tramway from the Silver Plume mill to the railroad has been completed, which saves 50 cents a ton in the handling of ore. In running 17 ft of a drift upon the Little Giant lode, on Red Elephant mountain, $1,675 was taken out, a fraction over $98 a foot. A contract to sink the shaft on the Big Horn lode, 40 ft from its present depth, has been let to some parties from Idaho springs. A mill run of 12,270 pounds of ore from Louis Bach's lease on the Boulder Nest returned $549.25. The first class milled 224 ounces per ton. John Dean, lessee on the Alhambra, Leavenworth mountain, netted over $300 from his lease last month. The ore mills 623 and 303 ounces per ton in two classes. A syndicate of capitalists from Pittsburg, Pa., are expected to arrive here this week for the purpose of examining the Moore Mining Co.'s property, with a view of purchasing. The shafts of the Baltimore and Fenton are being steadily sunk, and the drifts are being driven ahead. About 60 men are employed. The average value of all the ore shipped is 300 ounces per ton. Messrs. Tallman, Young & Co., lessees on the Main lode, are drifting and stoping easterly, 70 ft down the main shaft, on a very fair vein of ore. A mill run of two tons on Saturday last gave 72 ounces silver and 2-10 of an ounce gold per ton. Michael Doyle and Geo. E. M. Gray have leased and bonded the Night Hawk lode, on Silver creek, and work has been started up. This claim is unquestionably the extension east of the Joe Reynolds No. 3 lode. Some good mineral has been taken from the shaft. One lot gave 640 ounces silver to the ton. Between sixty and seventy men are at present employed on the Seven-Thirty, and the work of development is steadily progressing. Nine drifts or headings are being driven and new ground continually opened up. During the past six months, 1,000 feet of drift have been added to the already very extensive underground workings. In the month of July, 41 tons of smelting ore were shipped, averaging $138 per ton after deducting freight and smelting charges.

IDAHO.

COEUR D'ALENE.—*Eagle*, August 4: For the amount of development Coeur d'Alene shows up better prospects than the most sanguine expected last year. We are very slowly, but surely, recovering from the effects of the collapse. There is a gradual increase in the amount of gold shipped from the camp which is doing silent, but serviceable, work in advertising its real worth. Coeur d'Alene is rapidly achieving success. One month ago the camp was regarded as an immense railroad fraud, and every paper in the country, when hard up for legitimate matter, interviewed some pimp or tin-horn gambler who had "gone broke" in Coeur d'Alene, and would villify the camp to the extent of two columns for a drink of coffin varnish. Now, the press of the country are silenced by the steady and increasing output of dust from Coeur d'Alene, and they are beginning to concede to us respectful recognition as a bona fide mining camp. This is a great concession, and one for which we are duly thankful. All we need is liberal advertising to draw the attention of capital to our mineral wealth. Many a poor prospector owns a valuable ledge, which can be bought for a trifle. Coeur d'Alene is only one camp out of a hundred which is inviting capital, it is true, but it is equally true that it is first in the attractions it offers to those desirous to invest in mining enterprises, and it offers more for the money than any other camp has ever done before.

NEW MILL.—Idaho *World*, August 6: The Forest King Co. have sent by telegraph for a mill just like the one now at work at the Golconda mine. Some of the company went up to the Golconda mine on Friday last, and were well pleased with Monroe & Co.'s mill, came back and telegraphed for the mill to be shipped immediately. It will be put up and set to work as soon as possible on its arrival. The Forest King is proving itself to be one among the best mines in the country. It is about six miles from this place, and its locality can be seen from certain points here distinctly. Things are beginning to look up in this county, and the day is not very remote when our hills will be full of quartz mills.

BELLEVUE KING.—Belluvue *Chronicle*, August 7: As work progresses on the Bellevue King it continues to loom up in grand proportions. Both walls have been found and the vein will average six feet in width, two feet of which is very rich gray copper ore. The company are now sinking the shaft and raising from the tunnel to make connection for air. They have a carload of ore that will yield $1,000 per ton ready for shipment, and there are on the dump over one hundred tons of second-class rock which will yield an average of $100 per ton and more. The Chicago, owned by the W. R. S. Co., and patented last year, lies parallel with the King and has every indication of being as valuable property and it is strange the company do not expend a few hundred dollars in developing it.

SNAKE RIVER BLACK SAND. Boise *Democrat*, August 8: Several weeks since H. S. Cheasbro, with a force of men, gathered up something like a ton of black sand on Snake river, near Walker & McOuat's ferry, and sent it to Omaha for testing. It had never been supposed that this sand contained gold, and it had never been tried, the question always being how to get rid of it in mining the banks and bars of the river. Mr. Cheasbro informs us that he has just received the returns on the sand sent to Omaha and the test proves it to have been worth $864 per ton. The result was as unlooked for as startling, and he thinks that on the strength of it the Rhode Island Company, to whom he sold his interests on Snake river, will now come out and go ahead with the dam and other contemplated work; in fact, they write that such is their intention.

MULDOON WORK.—Bellevue *Chronicle*, August 6: Thos. McNara, has been engaged by Supt. Haight, of the Muldoon mine, to take charge of the concentrator, which will be set in motion on Tuesday morning. Thomas was for sometime assistant former of the Minnie Moore works and proved that he was perfectly competent to manage such machinery. The Muldoon has about 600 tons of second-class ore piled up on the dump and in the stopes upon which the jigs will begin at once and the property is opened in such shape that there will be no lack of ore to make a continuous run. One furnace of the smelter will also be fired up in a few days.

MONTANA.

I X L.—Butte *Miner*, August 8: This is situated west of the Burlington mine, and is operated under a lease by Messrs. Archer, Overman and Sarchet. The stopes of the east drift are yielding about 10 tons of ore per day, which is reduced at the Colorado smelter.

The Saturn, immediately west of the Park street bridge, is leased by Baker and Swarnsen. The lead is 3 ft wide. Assays have been obtained as high as 1,000 ounces and a shipment to be made to the mill this week is expected to produce very handsome returns.

The Placer Lode claim, joining the Saturn on the south, is leased by Messrs. Swarnsen, Vineyard and Cane. The lessees have milled 30 tons of ore which returned from 80 to 130 ounces. They have 20 tons now at the Colorado smelter, from which still better returns are expected.

The Orphan Girl, located south of the Big Butte, has so far proven a bonanza for the lessees, Messrs. Wallace, Moffit & Co. At the Dexter mill it was ascertained that the mill had been running steadily on Orphan Girl ore since January 1st, crushing 25 tons per day of average 30-ounce rock, which would give the very handsome aggregate of 157,500 ounces in a seven months' run.

THE ANACONOA REDUCTION.—A rumor gained circulation last week which created considerable excitement to the effect that the Anaconda Company contemplated a considerable reduction of its working force at the mine, and that the reduction would commence with laying off 100 men on the 1st inst. A *Miner* reporter yesterday questioned an officer of the company as to whether or not the rumor had any basis in fact, and was informed that it had not, any further than that as in order to keep up the large shipments of high-grade ore it was now necessary to employ a sufficient force to handle the immense quantities of low-grade ore which is extracted with the shipping ore; that with the completion of the smelter this necessity would cease, and as there would be a larger reserve of extracted ore on hand it would not be necessary to employ so large a force at the mine; and that some reduction would probably ensue, but that no general or sweeping reduction was contemplated.

THE CABLE MILL.—Anaconda *Review*, August 8: The Cable mill Phillipsburg, is at work upon ore from the Cable mine and is running steadily night and day. The mill and surroundings are models of neatness and cleanliness. Harvey Showers, the well known miner, is mine foreman, and John Sloss is foreman in the mill. The power is furnished by a 75 horse-power Corliss engine. At night the mill is lighted by electricity. Phillipsburg bids fair to prove a very lively point this summer. The erection of the 20-stamp mill by the Granite Mountain Co., work on which is announced to begin at once will give employment to a large number of men. Every one will be pleased to learn of the town regaining some of its wonted prosperity.

NEW CONCENTRATES.—The lower workings of the Gray Rock having run into copper, the working force has been taken off from that mine and transferred to the La Plata, which will now be worked with a full force. The Alice mills are keeping up their steady run and average bullion shipments. The Moulton stamps are dropping 40 strong on 40-ounce rock. The increased capacity and liberal policy of the Colorado smelter toward ore sellers and custom mill patrons have given a great impetus to the development of smaller properties. The Dexter mill continues to pound out fine bullion shipments from Orphan Girl ore. The Liquidator continues to ship from 15 to 20 tons of high-grade ore per day. Clark's Colusa is making large shipments of ore to Baltimore. The frame of Clark's new concentrator is up; the machinery is en route and will be in position before the end of September.

NEW MEXICO

MINING MATTERS.—Silver City *Enterprise*, August 6: Messrs. Bonner & Campbell are taking out some excellent ore from a claim two miles east of Fleming, which they will dispose of to ore purchasers making the highest bid for the same. A sample car of ore was shipped during the week from the Telegraph company's property which according to sample will run about $250 per ton. Regular shipments from this property would pay the stockholders handsomely. Peter Wagner's five-stamp mill, at Pinos Altos has been running on custom ore for the past two weeks that averages two ounces in gold per ton. The ore belongs to Mexicans who have considerable quantities on the dumps of their mines. About seven or eight tons per day is what the mill treats. McGregor Bros. have during the past month shipped two carloads of concentrates, returns from which have not yet been received. The mill is working as nicely as could be desired, having had but one slight accident since starting, July 1st. The Mimbres mill is also running on regular time. Two cars of ore, the first of which averaged 304 ounces, were shipped from the Commercial mine, at Georgetown, last month. The returns of the second car have not been received, but Geo. O. Smith states that it will run equally as well. This property will make a record this year that will astonish people not familiar with its management. It is undoubtedly one of the best and most economically managed mines in the territory. Thirty-one men are employed upon the mine at present. The incline is in about 100 feet. There is some talk of commencing work on the coal mines six miles from Lordsburg. The property is owned by residents of that town who have already expended a considerable sum in the development of their prospect. The claims are located very conveniently to the railroad, and if on developments there is coal in any considerable body found, it will be a most valuable find for the owners and the town of Lordsburg as well. The blossom and formation where work was discontinued is similar to that of the Fleming and Bullard's Peak mines, and it is believed that upon sufficient depth being attained the coal would improve. During the past week exploration work upon the Old Man mine has proven most satisfactory. A pocket was encountered from which a considerable quantity of ore was taken that contained free gold, that greatly enhanced its value. It was first discovered in the ore by William Swancoat, who had some trouble in convincing the gentlemen engaged with him in assorting the ore that it was not iron pyrites. Regular shipments of the higher grade ores taken out continues, but the lower grade upon the dumps will receive due attention when the contemplated mill is in operation. The management report everything most satisfactory. As work progresses upon the Gold gulch properties their merits begin to be apparent to persons who a few years ago doubted the existence of ore bodies in that camp. In no mining camp in this territory has development work been done with the rapidity of that performed in this district. On the Young man mine every foot of work shows it up to better advantage and encourages and stimulates Messrs. Rutter, Mikesell and Ficel to renewed efforts in the development of their promising claim. Nearly or quite 250 tons of ore that will go ninety ounces per ton are at present upon the dump ready for shipment. On the surrounding claims, many of which possess merit, ore is being taken out for shipment. When the continuity of the ore bodies has been demonstrated to any great depth capital will not long hesitate in making investments.

OREGON.

NOTES.—Oregon *Sentinel*, August 6: The Sterling mining company have commenced cleaning up. The China mines near Uniontown are still piping but they cannot last long with the present supply of water. All of the Galls creek miners did quite well this season, if it was a short season, so we are informed by Wm. Blackett. Mining has generally suspended throughout the county for the season but considerable prospecting is going on.

UTAH.

REVIEW.—Salt Lake *Tribune*, August 8: The receipts of bullion in Salt Lake City for the past seven months of 1884, excluding ore, were as follows: January, $449,228.74; February $364,696.47; March, $460,366 60; April, $432,809.44; May, $343,416.15; June, $530,532.90; July $530,978.35; Total $3,120,938.65. This does not include a number of current operations which make no reports except at the close of the year. The receipts of bullion and ore in this city for the week ending August 6th, inclusive, amounted to $157,199.70 of which $141,999.55 was bullion, and $15,200.15 ore. The week previous the receipts were $126,364.05, of which $117,044.05 was bullion, and $9,320 ore. The shipments of the Horn Silver Company for the week were twenty-two cars of bullion, $66,000; total for the year to date, $1,444,000. This company has declared its third quarterly dividend for 1884, amounting to $300,000 payable Aug. 15th; total dividends for this year to date, $900,000. This is the fourteenth dividend. The shipments of the Ontario for the week were fifty-two bars, assaying $34,790.93; total product of 1884 to date, $985,787.37. On the 31st ult. the Ontario paid its regular monthly dividend of $75,000 being the ninety-seventh dividend. Seven monthly dividends have been regularly paid this year, of $75,000 (fifty cents a share) each, a total of $525,000, or $3.50 per share. The Crescent sent in two lots of ore, $4,400 and the Park City smelter sent in one car of bullion $1,700. The Stormont sent up during the week three bars of silver, $5,000. The product of the Hanauer smelter for the week was ten cars of bullion, $20,500. Ore is coming down now from the hills freely, and the smelters are well supplied.

WASHINGTON TERRITORY.

CLE-EL-UM.—*Kittitas Localizer*, Aug. 8: Prospecting parties are fitting nearly every day for the Cl-el-um mines, F. D. Schnebly, S. H. Seroy and a stranger started out on Saturday. Jimmy Grieve went down last week from the Cle-el-um mining district. He exhibited some fine specimens of quartz, but was very reticent as to its location. The new coal-fields on the Cle-el-um are not to exceed three miles from the projected railway line through the Stampede pass. The coal is bituminous; of superior quality; easily obtained, and unlimited in quantity. Moses Splawn and Joseph Stephenson returned from their prospecting tour north last week. They were unable to reach the point they started for on account of the snow. Moses Splawn says it is the worst season for prospecting he has seen. Jeff D. McDaniel came down from the Cle-el-um district last week. He says the Steeprun and Gray Eagle have a favorable outlook. And Cooper says there is enough good paying rock in sight in the bullion lode to justify putting up reduction or smelting works, The copper in this mine is fully 60 per cent,

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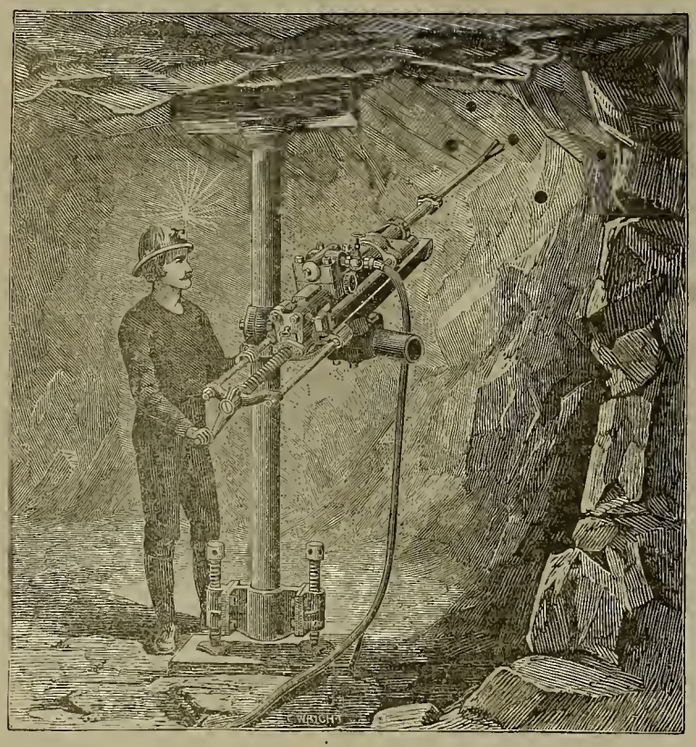

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Ingersoll, D2 3", large ports	1.735	ft. per hour.
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National, improved, 3½"	1.280	" "
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Ingersoll, D2 3", beat Rand 3½"	.744	" "
Ingersoll, D2 3", beat National 3½"	.505	" "
Ingersoll, E 3½", beat Rand 3½"	.560	" "
Ingersoll, E 3½", beat National 3½"	.321	" "
National beat Rand	.139	" "

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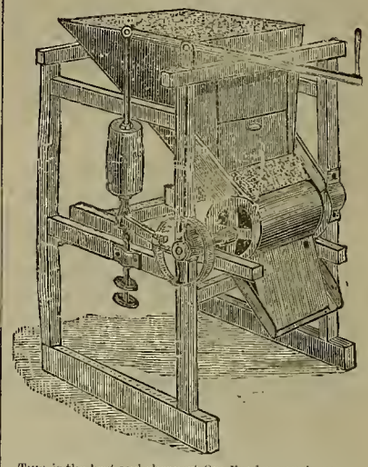

This is the best and cheapest Ore Feeder now in use.

It has fewer parts, requires less power, is simpler in adjustment than any other. Feeds coarse ore or soft clay alike uniformly, under one or all the stamps in a battery, as required.

In the Bunker Hill Mill it has run continuously for two years, never having been out of order or costing a dollar for repairs.

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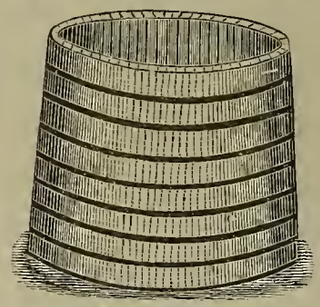

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Mr. F. A. Huntington, San Francisco, Cal.—DEAR SIR—The four-foot Centrifugal Roller Mill, bought of you in August, 1882, for the Whidden Gold Mining Company, of Shingle Springs, has given entire satisfaction, both on our own and on custom work, saving from 85 to 90 per cent of the gold in the mill. In conclusion I will say that we are so well pleased with it that Mr. Whidden and myself are putting one of the same size on the Tohongo gold mine, near Ravenna, in Los Angeles county.

Yours truly, P. VEASEY,
34 California St., S. F.

FINE GOLD GULCH, Nov. 10, 1883.

Mr. F. A. Huntington, San Francisco, Cal.—DEAR SIR—In reply to your inquiry concerning the working of your Centrifugal Roller Quartz Mill, I am pleased to say that I run one of them for seven months, doing custom work on different varieties of rock, and that the mill gave satisfaction in every respect, and did all that you claim for it.

Yours truly, BYRON JENNINGS.

GARIBALDI MINE, Dec. 17, 1883.

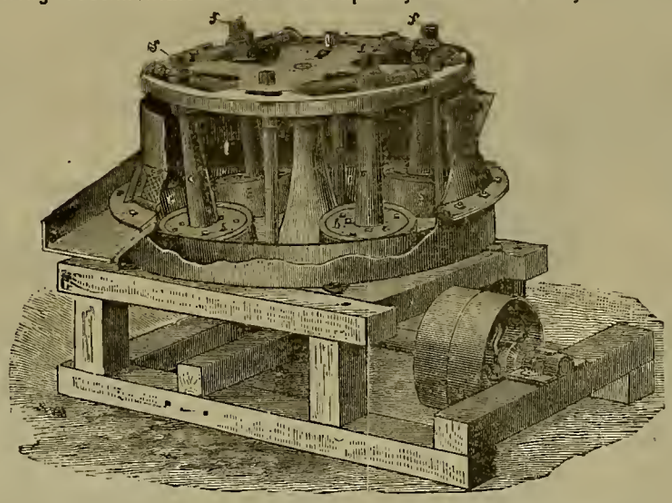
F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR—In reply to yours of the 10th inst., I take pleasure in assuring you that your Centrifugal Roller Quartz Mill gives entire satisfaction, and I can heartily recommend it to mining men who want a cheap and efficient crusher.

Yours truly, E. I. PARSONS, Supt.

32 WASHINGTON AVENUE,
SAN FRANCISCO, Dec. 29, 1883.

F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR: Having run one of your Centrifugal Roller Quartz Mills on sample lots of rock from more than twenty different mines, I must say that in every instance it has given the best of satisfaction in every particular; and I recognize its superiority over any other mill manufactured.

Very truly yours, D. O. MOWRY.



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The work done by the Centrifugal Roller Quartz Mill, during the past two years, on various mines and different kinds of rock, PROVES ALL THAT IS CLAIMED FOR IT, VIZ.:

1. The cost of same capacity is not more than one-half that of stamps.
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3. Cost of erection at mine one-tenth that of stamps.
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5. The wear is less than that of stamps.
6. The wearing parts are easily duplicated.
7. It has a much better discharge, and leaves the pulp in better condition for concentrating.
8. It is a better Amalgamator, saving fully nine-tenths of the gold in the mill; the balance can be saved on plates in the usual manner.
9. It is continually crushing; not like the stamp, using power to suspend it in air ninety-nine one-hundredths of the time and the balance making a thundering noise, and accomplishing *comparatively* small results. It is as far in advance of the stamp mill as the present method of making flour with improved rolls is over the Indian's mode of crushing corn in a stone mortar.

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This machine requires less power, less care or attention, and is less liable to get out of repair than any concentrator now in use; all of which any practical miner will comprehend when seeing it in operation.

SONORA, CAL., Dec. 1, 1883.

F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR:—In reply to yours of recent date, inquiring about the Centrifugal Mill which I bought of you, I will say that I have run the mill four months on hard rock; and I take pleasure in adding that the mill has in every way given the best of satisfaction.

Yours truly, J. H. NEALE.

GARIBALDI MINE,
Calaveras Co., Cal., Dec. 17, 1883.

F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR:—In answer to your inquiry concerning the working of the five feet Centrifugal Mill, bought of you for the Garibaldi mine in Calaveras county, I take pleasure in saying it gives entire satisfaction in every respect, and I only regret that the mine does not warrant the purchase of more of them and the continued use of the one now in operation.

Very truly yours, O. B. SMITH.

F. A. Huntington Esq., San Francisco, Cal.—DEAR SIR—Your Centrifugal Roller Quartz Mill has run on the Whidden Gold Mining Co. property at Shingle Springs, El Dorado Co., Cal., about four months, and it has done good and satisfactory work, a greater proportion of gold remaining in the mill than in the stamp battery. FRED JONES, Supt.

HILDRETH RANCH, Fresno Co., Cal.,
January 11, 1884.

F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR—In regard to your mill (Centrifugal Roller), I have crushed about 500 tons of rock in the mill, and am glad to say that it has given entire satisfaction, and can recommend it to the public as the most expeditious and least expensive method for crushing and milling ore that I have ever seen. Truly yours,

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PATTEN'S

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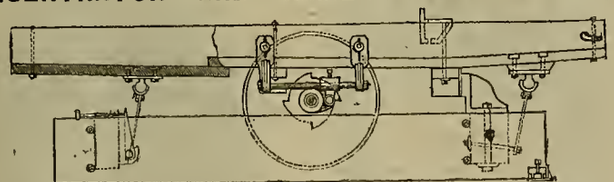

This machine requires less power, less care or attention, and is less liable to get out of repair than any Concentrator now in use. All of which any practical miner will comprehend when seeing it in operation.

The wear and tear is nominal, and the construction so simple that any miner can put it up and run it; and the low price brings it within the reach of all millmen, as it will save enough to pay for itself in any mill in a very short time. One machine will concentrate the tailings from a five-stamp battery.

The undersigned is now located at the Ætna Iron Works, 217 to 221 Fremont street, where he is building the above machines and prepared to fill orders, and guarantee them to do all that is claimed. Weight 625 pounds; price, $300. **Estimates given and orders promptly filled for all kinds of Mining Machinery.**

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Electric Amalgam Company—GENTLEMEN: We have analyzed a sample of your Sodium [Electric] Amalgam, which gave 2½ per cent of Sodium. We have used 10 parts of common quicksilver on a small quantity of free gold ore, and extracted 5 ounces per ton. By use of 8 parts of common quicksilver and 2 parts of your Amalgam, extracted at the ratio of 36 ounces per ton. Yours respectfully, (Signed) TORREY & EATON.

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Mining Share Market.

While considerable interest is shown in stocks just now prices have been downward. After the recent rise dealers seemed to take fright and the market has not been sustained. Notwithstanding all that is being said against the Comstocks, work in the various mines on the lode goes on as usual. It is expected that the Consolidated Virginia and California claims—the great bonanza mines—which were formerly one and were segregated, will again be consolidated as one mine to save expenses of salaries for officers.

Quartz continues to increase at the bottom of the deep winze below the 3200 level of the Mexican. The west crosscut on the 500 level of Ophir is being rapidly advanced toward a point where it is expected a large amount of good milling ore will be found.

At the Best and Belcher and Gould and Curry the north drift from the 825 station of the Bonner shaft is being rapidly advanced through new ground, and will soon be in a sufficient distance to begin running crosscuts.

The Chollar folks have reached ground in the main south drift on their 2800 level that shows much quartz. It was a "false alarm" about their having commenced crosscutting a few days ago, but now crosscutting has really been commenced on this level. At Gold Hill the usual quantity and quality of ore is being extracted from the old upper levels and sent to the mills on the river.

Bullion Shipments.

Paradise Valley, Aug. 4, $4,748; Hanauer, 4, $2,000; Horn Silver, 4, $12,000; from Boise, Idaho, 6, $37,192; Ontario, 5, $9,199; Horn Silver, 5, $24,000; Day, 5, $9,708; Ontario, 6, $5,189; Horn Silver, 6, $6,000; Hanauer, 6, $8,100; Wood River, 6, $7,500; Stormont, 6, $5,000; Lexington, July 28, $20,368; Allen Hay, 30, $2,912; Dexter, 30, $7,408; Alice, 30, $5,840; Moulton, 30, $14,832; Dexter, 29, $7,936; Alice 29, $18,000; Lexington, Aug. 1, $20,112; Silver Bow, 1, $24,000; Ontario, 7, $5,515; Horn Silver, 7, $9,000; Hanauer, 7, $3,850; Crescent, 7, $4,400; Wood River, 7, $1,550; Ontario, 9, $11,175; Hanauer, 9, $1,700; Crescent, 9, $1,850; Hanauer, 10, $4,800; Wood River, 10, $4,850; Bodie, 5, $1,755; Navajo, 11, $10,000. Salt Lake banks report the receipts for the week ending August 6th, inclusive, $141,999.55 in bullion and $15,200.15 in ore; a total of $157,199.70. During the week ending August 10th forty-two cars of bullion and forty cars of ore were shipped East out of Utah.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JAKED C. HOAG—California.
J. J. BARTELL—California.
A. S. DENNIS—San Mateo county.
A. C. KNOX—Nevada (State.)
B. W. CROWELL—Fresno and Tulare counties.
JOHN H. STURCKE—Santa Clara and San Benito counties.
GEO. MCDOWELL—Plumas and Sierra counties.
WM. PASCOE—San Francisco.
WM. H. COOK—Alameda county.
H. G. PARSONS—Idaho and Montana.

PROGRESSIVE SCIENCE IN OPTICS.—There is no calling requiring such constant study as that of a first-rate optician, to whom the progressive developments of the present day continually present new difficulties and problems to solve. By close attention to his profession, and over thirty years' practical experience, C. MULLER, the well known optician, 135 Montgomery street, has gained for himself the gratifying distinction of being the leading optician of the Pacific coast. All complications of defective vision most carefully tested free of charge. Sole depot of Pebble Spectacles. 2

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First street, a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below costs, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. References as to above can be had upon applying to this office.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT	SALE.	SECRETARY.	PLACE OF BUSINESS
Arnold G & S M Co	Arizona	2	50	Aug 1	Sept 2	Sept 19	A Judson	320 Sansome st
Alpha Con M Co	Nevada	18	50	July 16	Aug 21	Sept 10	W Willis	309 Montgomery st
Alaska M and M Co	Alaska	7	1.00	July 22	Aug 26	Sept 16	E F Stone	306 Pine st
Boracic Acid M Co	California	3	05	July 21	Aug 25	Sept 15	H C Droger	309 Montgomery st
Bodie Tunnel M Co	California	9	20	June 30	Aug 2	Aug 20	C C Harvey	309 California st
Best & Belcher M Co	Nevada	30	50	July 9	Aug 14	Sept 2	W Willis	309 Montgomery st
Benton Con M Co	Nevada	13	25	July 22	Aug 26	Sept 15	W H Watson	302 Montgomery st
California M Co	Nevada	13	20	Aug 4	Sept 11	Oct 8	C P Gordon	309 Montgomery st
Caborca M Co	Mexico	9	05	July 18	Aug 22	Sept 22	H C Edgerly	328 Montgomery st
Con Amador M Co	California	7	50	July 21	Aug 21	Sept 10	F B Latham	408 California st
Chollar M Co	Nevada	14	50	July 23	Aug 26	Sept 15	C L McCoy	309 Montgomery st
El Dorado South Con M Co	Nevada	14	2.00	July 14	Aug 14	Sept 4	D M Kent	330 Pine st
Equitable Tunnel M Co	Utah	30	30	July 29	Sept 15	Oct 7	W A Van Bokkelen	419 California st
Enterprise M Co	California	1	15	July 1	Aug 15	Sept 5	W Van Bokke'en	419 California st
Golden Fleece G M Co	California	33	50.00	Aug 6	Sept 10	Sept 27	F Schermier	412 Sixth st
Humboldt Hill M & M Co	California	1	15	July 15	Aug 19	Sept 5	J Stadtfeld	419 California st
Martin White M Co	Nevada	18	25	July 25	Sept 4	Oct 2	J J Scoville	309 Montgomery st
Mayflower Gravel M Co	California	25	10	July 10	Aug 12	Sept 5	J Morizio	328 Montgomery st
Mono G M Co	California	21	50	July 8	Aug 12	Sept 1	G W Sessions	309 Montgomery st
Morgan M Co	California	11	1.00	July 3	Aug 30	Sept 22	C S Neal	309 Montgomery st
New York Hill M Co	California	8	20	July 29	Sept 2	Sept 23	J B Lightner	527 Clay st
Oleta M Co	California	1	25	July 26	Aug 30	Sept 20	T H Canevard	9th and Market sts
Pittsburg M Co	California	10	05	July 11	Aug 15	Sept 5	C G Brooks	210 Front st
Potosi M Co	Nevada	16	50	July 29	Sept 2	Sept 23	C L McCoy	309 Montgomery st
Real Del Castillo M Co	Mexico	2	20	June 28	Aug 4	Aug 22	A Judson	320 Sansome st
Rainbow M Co	California	11	15	June 16	July 21	Aug 18	P F Mohrhardt	311 Montgomery st
Summit M Co	California	7	05	Aug 4	Sept 8	Sept 29	G W Sessions	309 Montgomery st
Santa Anita M Co	California	7	02	July 30	Sept 2	Sept 22	J M Burlingame	306 California st
Scorpion S M Co	Nevada	18	10	June 25	Aug 1	Aug 22	G S Spinney	310 Pine st
Valapara M Co	Mexico	2	20	June 28	Aug 4	Aug 22	A Judson	320 Sansome st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Alaska M Co	California	A Judson	320 Sansome st	Annual	Sept 2
Arnold M Co	California	A Judson	320 Sansome st	Annual	Sept 2
Alta S M Co	Nevada	W H Watson	302 Montgomery st	Annual	Aug 21
Con Pacific M Co	Nevada	F E Luty	330 Pine st	Annual	Aug 16
Independence M Co	California	J W Pew	310 Pine st	Annual	Aug 18
Murchie M Co	California	W Letts Oliver	328 Montgomery st	Annual	Aug 29
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	Annual	Aug 21
Peabody M Co	Montgomery	R D Hopkins	436 Montgomery st	Annual	Aug 19
Real del Castillo M Co	Mexico	A Judson	320 Sansome st	Annual	Sept 2
Villagrana M Co	Mexico	A Judson	320 Sansome st	Annual	Sept 2

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	May 15
Bodie Con M Co	California	G W Sessions	309 Montgomery st	50	June 5
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	May 27
Idaho M Co	California			4.00	Apr 2
Jackson M Co	California	D C Bates	309 Montgomery st	10	Mar 16
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 21
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Apr 28
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Mar 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Apr 2

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 24.		WEEK ENDING July 31.		WEEK ENDING Aug. 7.		WEEK ENDING Aug. 14	
Alpha	.85	1.45	1.15	1.60	.90	1.10	1.00	1.50
Alta	2.60	3.10	2.20	2.90	1.75	2.35	1.95	2.55
Andes	.40	.45	.40	.45	.30	.40	.25	.30
Argenta				.10				
Belcher	.95	1.15	.90	1.25	.95	1.15	1.00	1.05
Belding								
Best & Belcher	2.15	2.90	2.30	3.65	2.15	3.05	1.75	2.85
Bullion	.65	.95	.70	.90	.60	.70	.55	.70
Bonanza King								
Belle Isle	.55	.60	.50	.60	.50	.60	.50	.60
Bodie Con	1.50	1.70	1.60	2.30	1.70	2.25	1.75	2.60
Benton	.50	.70	.40	.45	.30	.40	.30	.50
Bodie Tunnel								
Bulwer			.45	.70		.60		.60
California		.30	.25	.35	.10	.25		.10
Challenge	.20	.25	.20	.30				.25
Champion		.10						
Chollar	3.70	5½	2.70	5.00	2.50	3.40	2.75	4.10
Confidence		1.50	1.15	1.30				1.00
Con. Imperial				.10				.05
Con. Virginia	.30	.45	.35	.50	.25	.35	.25	.30
Con. Pacific		.45	.45	.50		.25	.50	.55
Crown Point	1.30	1.50	1.35	1.75	1.35	1.50	1.35	1.45
Day								
Eureka Con		2.50	2.60	2.75		2.40		2.50
Eureka Tunnel				.50				
Exchequer	.30	.45	.35	.45		.35	.40	.50
Grand Prize	.30	.40	.50	.55	.50	.55	.60	.75
Gould & Curry	1.75	2.45	2.20	3.70	2.00	3.10	2.20	2.50
Goodshaw								
Hale & Norcross	4.75	7.00	3.90	8.00	2.25	4.60	2.40	2.95
Holmes								2.00
Independence		.30		.25		.25		.25
Julia								
Justice	.30	.55	.25	.50	.10	.30		.20
Martin White				.25				
Mono	.20	.35	.25	.30	.25	.30	.60	1.75
Mexican	1.95	2.60	2.30	3.15	1.85	2.45	2.00	2.35
Mt. Diablo								
Northern Belle								
Navajo	4.10	4.20	1.00	4.25	3.80	3.90	2.75	4.00
North Belle Isle		.20						
Occidental	1.40	1.50	1.40	1.60		1.25	1.10	1.15
Ophir	1.55	1.80	1.55	2.35	1.25	1.90	1.35	1.50
Overman	.20	.22	.25	.30	.20	.25	.15	.25
Potosi	1.80	2.50	1.45	2.75	1.25	1.75	1.45	2.15
Pinal Con								
Savage	1.30	1.95	1.35	2.40	.90	1.45	.90	1.15
Seg. Belcher				2.00			1.75	2.00
Sierra Nevada	1.60	2.00	1.30	3.65	2.00	2.65	2.20	2.50
Silver Hill		.10		.10		.10		
Silver King	4.75	5.00		4.95				4.50
Scorpion	.20	.25	.25	.50	.30	.40	.30	.40
Syndicate	.45	.50	.45	.50				.40
Tioga								
Union Con	1.70	1.80	1.75	2.70	1.65	2.15	1.70	2.00
Utah	1.00	2.00	1.70	2.65	1.40	2.00	1.40	1.95
Yellow Jacket	2.00	2.25	2.10	2.60	2.05	2.20	2.00	2.15

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Aug. 14. AFTERNOON SESSION.

550	Alta	2.60@2.65	200	Alta	2.45
100	Alpha	1.25	200	Alpha	1.25
275	Bodie Con	2.10@2.15	10	Belcher	95c
50	B. & Belcher	2.55	230	B. & Belcher	2.55
950	Benton	45@50c	100	Bullion	55@60c
50	Bullion	60c	100	Bodie	2.10
200	Belmont	1.25	1300	Belle Isle	65@70c
450	Belle Isle	85c	10	Crown Point	1.45
910	Chollar	3¼@3.55	1800	Con. Virginia	25@30c
50	California	10c	80	Chollar	3.40@3.45
200	Excheequer	10c	325	Gould & Curry	2.25@2.30
270	Gould & Curry	2.30	540	Grand Prize	55c
170	Hale & Nor	2.50@2.55	1050	Hale & Nor	2.40@2.55
50	Holmes	2.00	245	Mexican	2.00@2.05
200	Mexican	2.05	450	Mono	90c
780	Mono	75@80c	500	Navajo	4.00
700	Navajo	4.10@4.15	160	Ophir	1.30@1.35
450	Ophir	1.30	200	Sierra Nevada	2.15@2.20
270	Potosi	1.80@1.85	760	Savage	90c
900	Savage	95c@1.00	200	Syndicate	45c
410	Sierra Nevada	2.05@2.10	20	Scorpion	30c
200	Scorpion	30c	50	Yellow Jacket	2.00
300	Union	1.60			

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, August 14, 1884

ANTIMONY—Per pound	8½@	9
BORAX—Refined	16 @	—
IRON—Glengarnock ton	24 50 @	—
Eglinton, ton	24 00 @	—
American Soft, ton	27 00 @	—
Oregon Pig, ton	@	—
Sipper Can, Nos. 2 to 4	30 00 @@32	50
Clay Lane White	23 00 @	—
Shotts, No. 1	26 00 @	—
Refined Bar	3½@	3
Boiler, 1 to 4	5 00 @	5 50
Plate, 5 to 10	4½@	4¾
Nail Rod	7½@	—
Norway, according to thickness	6½@	7¾
STEEL—English, ₱	16 @	25
Black Diamond, ordinary sizes	14 @	—
Drill	15 @	—
Machinery	12 @	14
COPPER—Ingot	22 @	—
Brazier's sizes	16 @	25
Fire-box sheets	29 @	37
Bolt	25 @	—
Old	12½@	15
Bar	— @	—
Cement, 100 fine	12 @	—
Copper in New York, Aug. 13	13¾@	14¼
LEAD—Pig	4½@	—
Bar	5½@	6
Pipe	7 @	—
Sheet	8 @	—
Shot, discount 10% on 500 bags: Drop, ₱ bag	2 00 @	—
Buck, ₱ bag	2 20 @	—
Chilled, do	2 40 @	—
TIN PLATES—Charcoal	7 00 @	7 25
Coke	5 75 @	6 75
Pig	28 75 @	—
Banca tin	22 @	23
I. C. Charcoal Roofing, 14x20	6 25 @	6 50
ZINC—By the cas k	19 @	—
Sheet, 7x3 ft, 7 to 10 lb, less the cask	9 @	10
NAILS—Assorted sizes	3 25 @	—
QUICKSILVER—By the flask	30 00 @	—
Flasks, new	1 05 @	—
Flasks, old	85 @	—

THE EMBREY CONCENTRATOR.

Having sold my interest in the EMBREY CONCENTRATOR to the Frue Vanning Company, I offer for sale at cost a few I have on hand to close the business.

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & CO.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING AUGUST 5, 1884.

303,125.—ROCK PULVERIZER—Wm. Corcoran, S. F.

303,731.—SAFETY CAR TRUCK—J. Denechaud, Sr., S. F.

303,143.—WAVE POWER—Wm. Filmer, S. F.

303,000.—COFFER DAM FOR SCREW PROPELLER SHIPS—Chas. Goodall, S. F.

303,153.—GRAIN DRILL—C. G. Hampton, Turock, Cal.

303,012.—PEN HOLDER AND WIPER—P. D. Horton, Grass Valley, Cal.

303,013.—PEN HOLDER—P. D. Horton, Grass Valley, Cal.

303,223.—HARROW—W. A. Howard, Dixon, Cal.

303,039.—TIGHTENING DEVICE FOR TRUNK STRAPS—N. K. Pearson, S. F.

303,232.—SEPARATING GOLD AND SILVER FROM ARSENIDE OF IRON—Edw. Probert, Eureka, Nev.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise), at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CHIMNEY.—Leonard E. Clawson, S. F. No. 302,621. Dated July 29, 1884. This invention relates to the class of chimneys such as are made of cement or pottery-ware; and it consists of a joint and joint-band for the meeting ends of the sections, and the means for connecting the lower end of the chimney with a base or fireplace, and supporting the same on beams or studding of the building, and in certain details of construction.

WAVE POWER.—Wm. Filmer, S. F. No. 303,143. Dated Aug. 5, 1884. This is a machine for utilizing the power of the waves or breakers on the sea coast. It is an improvement on a former invention. It consists in a novel construction of the float, adapting it to take advantage of the impact or blow of the wave, and in various improvements in the gearing and intermediate devices by which the motion of the wheels to the float is transmitted to suitable machinery. The object is to provide means for utilizing the entire power of the wave.

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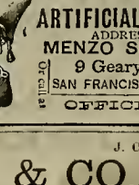

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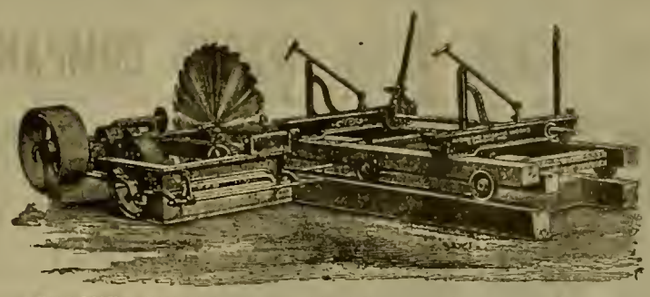

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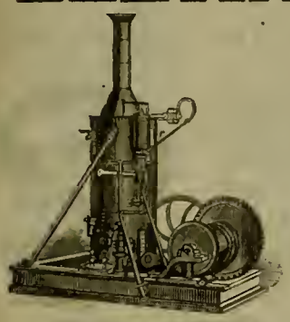

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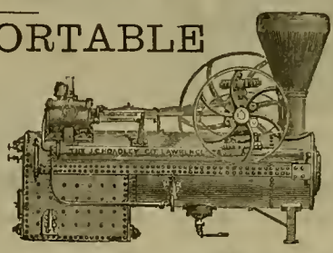

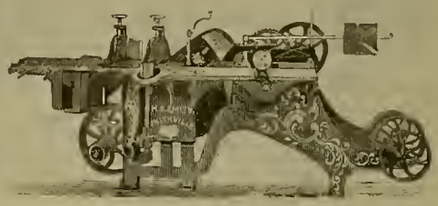

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E. G. DENNISTON, Proprietor.

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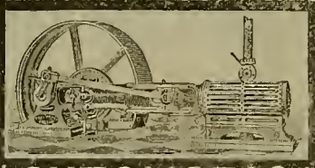
CLEVELAND OHIO.



AUTOMATIC

Awarded highest premiums at Cincinnati and Louisville Expositions of 1883, for "Best Automatic Engine." We will furnish anyone copies of the ORIGINAL ENTRIES of several engine builders who claim they were not competing with us. They all entered in the same class with us, and now by deceptive Circulars (one headed "Fact versus Falsehood,") attempt to mislead.

☞ No premiums were offered for Condensing Engines.

☞ JOSHUA HENDY MACHINE WORKS, Agents for the Pacific States, 49 & 51 Fremont St., San Francisco.

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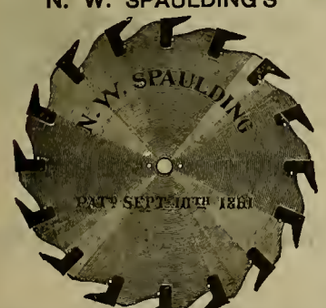

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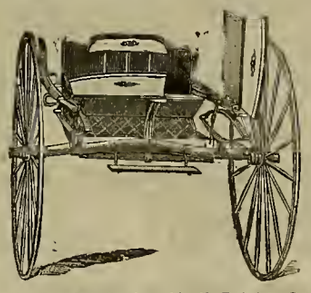

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The Spring Shaft does away with the disagreeable motion of the horse, and the open seat affords easy and safe access from the rear. It costs less to ship, is Light, Neat Stylish and easy riding.

Three men with Adel's Grain Elevator pile up in warehouse, or field, 1,500 sacks in a day. Address:

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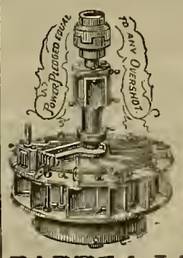

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All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rubber Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. ☞PRICES MODERATE.☜

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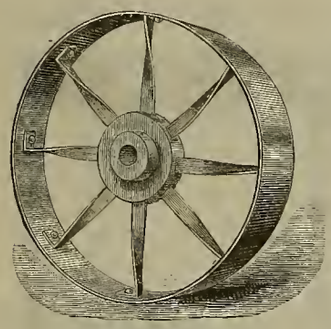

Advantages of these Pulleys.

They are less than half the weight of cast-iron pulleys; are polished on the face; are made either crowned or straight, and are turned in the lathe the same as the best make of cast-iron pulleys.

They are carefully balanced. They are subject to no contraction strains, and can be run at very high speed without danger of bursting.

On account of their great lightness and the form of the arms, they absorb less power than any other pulley.

They are *the only pulley of the kind* which runs true. They cannot be broken in transport.

TESTIMONIAL:

MATHER LANE SPINNING CO. (Limited), LEIGH, ENGLAND, Nov. 5, 1883.

N. Macbeth, Esq.—Dear Sir: The Patent Steel Pulleys supplied throughout to our No. 2 Mill are working to our entire satisfaction.

They are very true, and are about 50 per cent lighter than the cast-iron pulleys in our No. 1 mill.

Yours faithfully,

For the Mather Lane Spinning Co. (Limited),

[Signed:] RICHARD T. MARSH, Managing Director.

Risdon Iron & Locomotive Works,

Sole Manufacturers and Agents for the Pacific Coast,

S. E. Cor. Beale & Howard Sts., San Francisco

☞ Send for Circular and Prices.

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This COKE is exclusively used by Prof. Thomas Price, in his assay office, by the Selby Smelting and Lead Co., Prescott, Scott & Co., Risdon Iron and Locomotive Works and others in this city. Large supplies are regularly forwarded to consumers in Salt Lake and Nevada, to the Copper Queen Mining Co., Longfellow Copper Mining Co. and other consumers in Arizona.

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F. P. BACON, PRESIDENT C. L. FOUTS, SECRETARY

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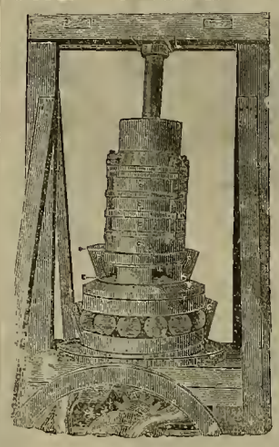

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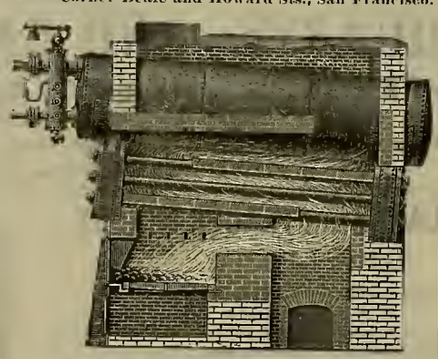

TESTIMONIALS.

ST. LOUIS, MO., Sept. 28, 1883

Messrs. Adolphus Meier & Co GENTLEMEN: We cheerfully certify that the "*Heine Patent Safety Boiler*" put up by you in our establishment has proved very satisfactory in its working. The chief points of excellence in the "Heine Safety Boiler" are its economy in fuel and space, freedom from scaling, aptitude for power and heating purposes, working equally well with clear and muddy water. We warmly recommend it to all using steam machinery. Yours truly,

ANHEUSER-BUSCH BREWING ASS'N

OFFICE OF SUP'T OF ROYAL RAILWAYS, BERLIN, Sept. 23, 1883.

To Mr. H Heine, Civil Engineer: In reply to your inquiry of September 2d, we respectfully inform you that the three boilers built under your patents, under steam since September 25, 1881, at the Alexander Place Depot, as well as the two at Friedrich Strasse Depot, under steam since September 22, 1882, have given good satisfaction, requiring no repairs whatsoever to date. The internal cleaning of the boiler was always accomplished with ease on account of the convenient arrangement of the tube caps, the adhesion of scales being fully prevented thereby, and the boilers kept in prime condition.

(Signed): BEAUCKE.

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PORTABLE HOISTING ENGINES FOR MINES A SPECIALTY.

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For the States of California, Oregon and Nevada, and the Territories of Idaho, Washington Montana, Wyoming, Utah and Arizona. Lightest, Strongest, Cheapest and Best Balanced Pulley in the World. Also Manufacturers of

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BAKER'S MINING HORSE POWER.

THE MOST EFFICIENT AND PRACTICAL MACHINE ever invented for the service of Prospectors and others requiring the use of a Horse Power; possessing all the requirements of a first-class hoist and affording means for the continuous operation of a Pump or Blower without interfering with a hoisting apparatus.

It is made entirely of Iron: no piece weighs over 250 pounds. At the ordinary speed of a horse a 1,000-pound bucket of ore may be raised 120 feet per minute. The hoisting drum is under the complete control of the man at the shaft, and is capable of carrying 500 feet of five-eighths steel rope. The cost of erection is slight, as two men in half a day can easily put it in place ready for work.

While this power is more particularly for mining purposes, it is equally adapted to all other uses where animal power is required. ☞SEND FOR CIRCULAR. Address

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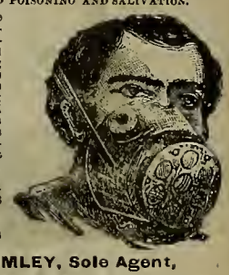
Patent Life-Saving Respirator.

PREVENTS LEAD POISONING AND SALIVATION.



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BOILER SCALE

Preventive and Remover.

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In use in 1,000 Boilers on Steamboats, Locomotives, Mills, Mines, Foundries, etc., in California. An

Infallible Preventive and Remover of Scale

☞Prevents the iron from rusting or pitting.

Shipped in ten gallon cases at 50 cents per gallon, by

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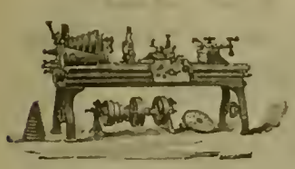

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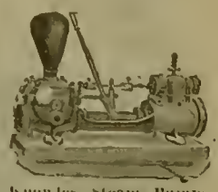

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Mining Machinery, Steam Pumps, Wood and Iron Working Machinery,

ENGINES and BOILERS.

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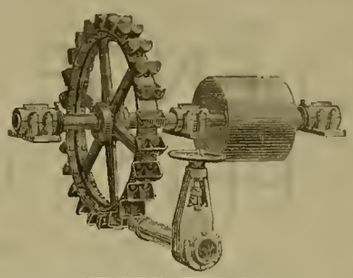

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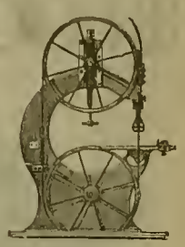

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STEAM PUMPS TO GO IN SHAFTS.

NO ENGINES OR BELTS. NO PUMP VALVES.

PRICE OF PLANT REDUCED ONE-THIRD.

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Agents of the Cameron Steam Pump.

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TRY OUR MAKE. CHEAPEST AND BEST IN USE.

UNION IRON WORKS,

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THE "DUC" STEEL BUCKET!

Always First Premium in Competitive Trials.

Extra Strong and Very Durable.

Made of Best Charcoal Iron. Only One Seam. No Corners to Catch. Runs with Least Power.

☞ BEST MINING BUCKET MADE. ☜

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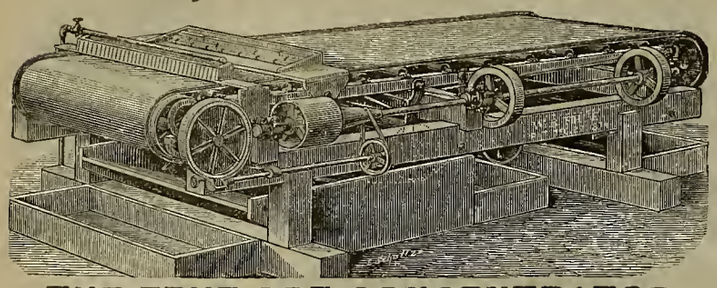
PRICES GREATLY REDUCED.

IRON CLAD MANUFACTURING CO.,
22 Cliff Street, New York.

$1,000 CHALLENGE!



THE FRUE ORE CONCENTRATOR,
OR VANNING MACHINE.

PRICE REDUCED, Jan. 1, 1884, to FIVE HUNDRED and SEVENTY-FIVE DOLLARS ($575.00).

OVER 800 ARE NOW IN USE. Saves from 40 to 100 per cent. more than any other Concentrator; concentrations are clean from the first working. The wear and tear are merely nominal.

A machine can be seen in working order and ready to make tests at the office of Hinckley, Spiers & Hayes, No. 220 Fremont Street, San Francisco.

To those Intending to Manufacture or Purchase the So-called "Triumph" Concentrator, we Herewith State:

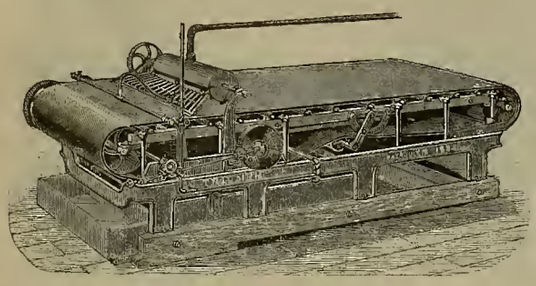
That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That we are and have been ready, at any time, to make a competitive trial against the Triumph, or any other machine, for stakes of $1,000.

ADAMS & CARTER, Agents Frue Vanning Machine Co.,
Room 7—No. 109 California Street, - - - SAN FRANCISCO, CAL.
January 3, 1884.

$1,000 CHALLENGE ACCEPTED!



THE
"TRIUMPH" ORE CONCENTRATOR.

PRICE FIVE HUNDRED AND FIFTY DOLLARS ($550.00), F. O. B.

THE "TRIUMPH" TRIUMPHANT!

In a competitive trial recently had between two of the "Triumph" Ore Concentrators and the same number of "Frue" Vanning Machines, at the mill of the celebrated gold producing Original Empire Mill and Mining Company, in Grass Valley, Nevada County, Cal., the "Triumphs" produced thirteen and fifteen one-hundredths (13.15) per cent more concentrations than did the "Frue" Vanners, during a run of twenty-four consecutive days, or a net gold coin result of $109.15, or $8.30 per day, in favor of the two "Triumph" Concentrators.

These returns do not include the value of the amalgam saved by the "Triumphs" during the test; which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarily saved, which is lost on the "Frue" Vanner.

This trial was conducted under the personal supervision of the Manager and Superintendent of that Company, in a strictly fair and impartial manner, and with the sole view of determining, in the interest of that Company, the merits and demerits of the respective machines by a thoroughly practical test. A relation of the course of procedure, a concise analysis of assays, and a tabulated statement of the net bullion results, with accurate deductions therefrom, will soon be published in Circular form.

The superiority of the present construction of the "Triumph" over the form originally introduced, together with the demonstrated results of the above, and other trials had with the "Frue" Vanners, induce us to and we hereby accept the Challenge of $1,000, flaunted by the Agents of the "Frue Vanning Machine Company," and hold ourselves in readiness to enter into a second competitive trial for that sum, at such place and upon such terms and conditions as may hereafter be mutually arranged.

We guarantee purchasers against all costs, expenses or charges incurred by reason of any infringements of any existing patents.

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JOSHUA HENDY MACHINE WORKS,
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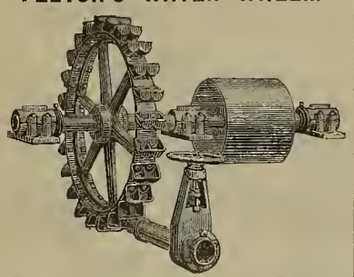

THIS WAS ONE OF THE FOUR WHEELS TESTED by the Idaho Company at Grass Valley, Cal., and gave 90 2 per cent., distancing all competitors. Send for Circulars and guaranteed estimates.

L. A. PELTON,
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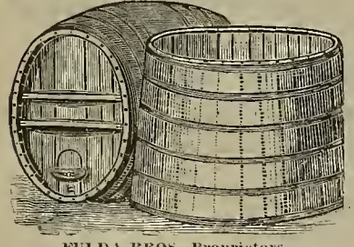

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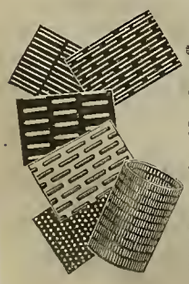

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Sheet Metals of all kinds perforated for Flour and Rice Mills, Grain and Malt Driers, Furnaces, Chess, Cement and Smut Mills, Separators, Revolving and Shot Screens, Stamp Batteries, and all kinds of Mining and Milling Machinery. Inventor and manufacturer of the Celebrated Slot Cut and Slot Punched Screens. Mining Screens a Specialty, from No. 1 to 15 (fine).

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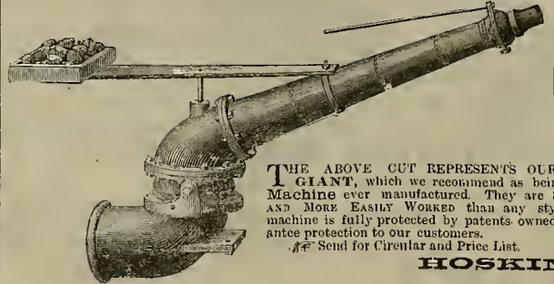


—TO—

HYDRAULIC

MINERS:

THE ABOVE CUT REPRESENTS OUR NEW IMPROVED GIANT, which we recommend as being the Best Hydraulic Machine ever manufactured. They are SIMPLER, LIGHTER, CHEAPER AND MORE EASILY WORKED than any style heretofore made. The machine is fully protected by patents owned by us, and we will guarantee protection to our customers.

Send for Circular and Price List.

HOSKIN & CO.,
Marysville, Cal.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

HY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, AUGUST 23, 1884.

VOLUME XLIX. Number 8.

Ore Concentration.

The concentration of mineral bearing ores and expedients for saving the precious metals they contain are subjects which are now attracting more attention than ever before in the history of mining. It is a well recognized fact that there are vast deposits of low grade ores in nearly every mining district that with some cheap and effective mode of concentration and amalgamation might become a source of great wealth. Bonanza mines are not as plentiful as we could wish, and mining men are beginning to realize the fact that the great dependence for the future must be on the ores referred to. Success in handling ores of this character must depend not only upon generally favorable conditions, but upon the ability to obtain by the first working what metal the ore carries, either in a free state or in the form of sulphurets, with a reasonable degree of closeness. That loss is sustained in this way by the best devices used heretofore, is a fact patent to every one familiar with the business.

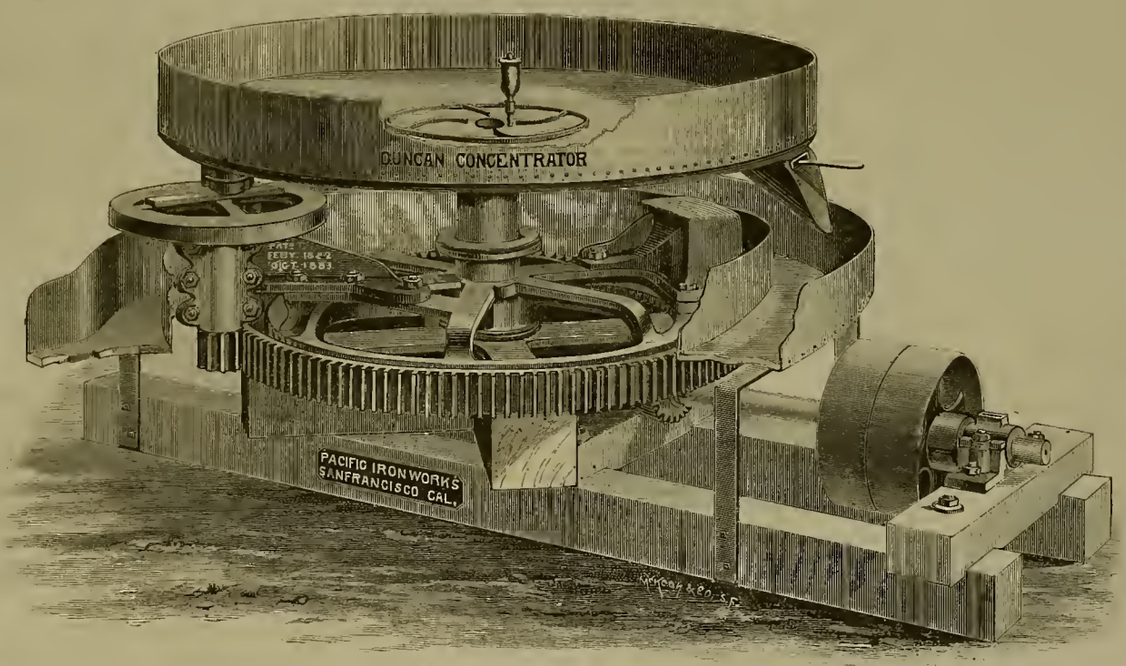
Expedients without number have been resorted to with a view to meeting this difficulty, but from various causes it must be confessed that the problem has not been satisfactorily solved. The first requisites for such machines are cheapness and simplicity of construction. Most of those now in use involve an expense out of all proportion to results, as well as a complication of construction that requires special skill to operate and make constant repairs necessary.

The Duncan concentrator illustrated on this page is claimed to obviate the objection urged against all forms of belt machines, and, though only introduced about eighteen months ago, is rapidly winning its way to popular favor.

This machine, as will be observed, operates upon a new principle, uniting by a very ingenious movement both a circular and jigging motion, the circular throwing the sulphurets to the outer rim of the pan and the jigging settling them to the bottom, where they are drawn out through a transverse opening and discharged into a circular tank, as shown in the cut, while the tailings flow to the center, through which they pass down and discharge into a sluice.

The pan by this circular motion, making eight revolutions per minute, causes the pulp to pass around and over its surface about three revolutions, or equal to a distance of thirty feet, before it is discharged, thereby giving the sulphurets sufficient time to settle before the gangue passes of. An adjustable tube regulates the overflow, which, in connection with the opening given the discharge gate, determines largely the closeness of working and cleanness of the product. It also has an adjustable wrist-pin on the balance-wheel, by which the motion can be varied to adapt it to the requirements of different classes of ore.

Another important feature of this machine and one that is not claimed by any other, is its quality as an amalgamator. The bottom soon wears bright by the attrition of the sand and collects all the amalgam that escapes the copper plates in a gold mill, or passes the settlers in a silver mill, and is more efficient in this way than any machine ever devised for this special purpose. A mill running six of them reports a saving of from $1,000 to $1,500 per month in amalgam that could not be saved by any other device.



THE DUNCAN ORE CONCENTRATOR.

The article appended, from the Arizona *Mining Index*, giving an account of a competitive test of the Duncan concentrator with the Frue at the Carlisle mine, with the statement of Col. James as to results, will be read with much interest by mining men in all parts of the country. The question of ore concentrators is an important one, and any facts throwing light on the subject are of value to the whole mining community.

"No class of mining machinery has so wide an application to this industry, or is regarded as so essential in the process of ore reduction, as the concentrator. The most interesting, as well as the most important test of the comparative merits of the two prominent systems of ore concentration that has ever been made in this country, has been recently concluded at the Carlisle mine, in New Mexico. The contest referred to has attracted so much attention throughout Arizona and New Mexico, that we have taken much pains to get the full particulars regarding it to lay before our readers. The following statement, furnished us at our request by the Pacific Iron Works of San Francisco, giving exact figures and details, will be read with great interest by mining men in in all parts of the country. The works referred to are the manufacturers of the Duncan concentrator, which, as will be seen, makes a record that has never been approached by any machine heretofore made.

OFFICE OF THE CARLISLE MINING COMPANY,
CARLISLE, GRANT CO., NEW MEXICO,
June 28, 1884.

PACIFIC IRON WORKS, San Francisco, Cal.—

Dear Sirs: In compliance with your request, I send you the following as the result of my trial of six Duncan and five Frue vanner concentrators, made in the months of February and March of the present year:

Length of run, eighteen days, nineteen and a half hours.

Four batteries of five stamps each, fed from the same ore bins.

Pulp from Nos. 1 and 3 went to the Duncans. Pulp from Nos. 2 and 4 to the vanners.

The ore worked contained sulphides of lead, zinc, iron and copper. Gangue principally quartz.

There was saved from the ore worked during the run of 694½ tons, $13.50 in value per ton in free gold by amalgamation in the batteries, and by running the pulp over silvered plates in the ordinary method used in gold mills.

After leaving the aprons, the pulp was run through the concentrators as described above.

I did not attempt to get at the value of the waste after leaving the concentrators, but made my comparison by weighing and assaying what was saved, with the following result:

From Duncan concentrators we saved 39½ tons of concentrates, containing—	
Silver, market value	$1,337 07
Gold " "	2,801 34
Total	$4,138 41
Also, amalgam that escaped the batteries, valued at	280 00
Total saved by Duncan Concentrators	$4,418 41
From the Frue Vanners we saved 34 tons of concentrates, containing—	
Silver, market value	$1,213 80
Gold " "	2,201 16
Amalgam saved, none.	
Total saved by Frue Vanners	$3,414 96
Difference in 694½ tons worked, credited to Duncans	$1,003 45

Yours truly, I. E. JAMES,
Sup't Carlisle M. Co.

"Tests of a similar character have in many cases, from one cause or another, been unsatisfactory, and without practical results. In the present instance, however, every opportunity was afforded for a fair and honest test of the merits and capabilities of both machines—such as would afford a basis of comparison that could be depended upon by parties in want of such information, and who have not had the opportunity of making a comparative test of the prominent machines in use. The conditions under which these machines were run, it will be seen, were such as to afford no possible advantage to either contestant, while the high character and standing of Col. James, who is well known as one of the most competent and successful mine managers in the country, is a guaranty of fair dealing, as well as to the correctness of the results." The report shows that five Frue vanners were worked against six Duncans. To avoid misapprehension, it should be stated that the cost of the six Duncans, set up in running order, was less than one-half that of the five vanners, indicating not only an advantage of nearly 30 per cent in results in favor of the Duncan, but a saving of at least one-half in the original outlay, as well as the labor and repair account largely in favor of the latter.

"Another fact of great significance is shown in the item of $280 credited to the Duncan for amalgam saved that escaped the batteries, making 7½ per cent of the entire amount returned by them, while none whatever was saved by the Frue. This difference would alone pay a large interest on the cost of such a plant, while the entire saving over and above that returned by the Frue would pay for the whole number of concentrators used at least ten times each year. When it is considered that the Frue vanner is claimed to be the best machine of the kind in use, the results here shown are most remarkable, and clearly indicate great progress in the direction of effective and economical ore reduction. The ores of the Carlisle Mine, as will be observed by the report, are of a very rebellious character, and calculated to test severely the close working and efficiency of any concentrator. The result is therefore all the more conclusive as to adaptation of the Duncan to all classes and combination of ore that can be treated by this process. While having no direct interest in any machine, method or process relating to mining, we record with pleasure the success of any invention that is calculated to assist in the material prosperity and development of this great industry."

A DISPATCH from Victoria (B. C.) says: The latest from Lolita creek, Skueena river, reports mining good. One man, it is said, has taken out by crevicing $688 inside of six hours. Some seventy men are mining on the creek, and ten companies. They are making good pay—$100 to the hand. The gold is coarse and spotted, averaging $16.75 to the ounce. The season commenced in July.

RUMOR says that the Hanby mine, near Douallon's bridge, in Calaveras, has been sold for $10,000. The mine is on a ranch, and in order to get the mine the purchasors were obliged to buy the ranch also, for which they paid $2,700.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Cliff Dwellings of Cosnino Canyon.

Last week we visited a noted canyon of cliff dwellings near Flagstaff, Arizona, seventeen miles distant from the southern base of the San Francisco mountains. Nothing in this wonderful country thus far explored proves so startling to us at first sight as cliff ruins. You drive along an excellent but new road through a noble forest of pine, beyond which at length you catch occasional glimpses of the opposite side of a rock-ribbed gorge. Presently you are near it, and gazing down over ledge after ledge of horizontal strata into its awful depths. As the eye sweeps along from side to side searching the crevices under each ledge, the vision reaches another and another of the strata, when at last a ledge jutting out a little more than its fellows is reached, and there under it, shining in the sunlight like a row of mud wasps' nests, on a brick underpining, is a white wall of masonry pierced at intervals with square apertures leading to dark enclosed recesses.

We were soon carefully letting ourselves down along a nearly vertical rent, conveniently crossing the strata at this point, to find a ledge immediately under our starting place, exhibiting the masonry described and at last we stood in the presence of its wondrous ruin.

No sign of foot-path, much less a wagon road led up or led down to the spot, but there, built up under the overhanging stratum of smooth limestone, were strong walls, eighteen inches to two feet thick, and many yards long, snugly embracing the outwardly curving ceiling, and enclosing large and convenient rooms, separated by thick cross walls and floored with hard level cement; evidence, all things considered, of determined, concerted, skilful, arduous and successful labor performed, who knows when, by a populous colony of, who knows whom, by means of, who knows what? There cling the little cages wedged into the crevices and thickly studding several benches, one above the other, on both sides of the long, deep, winding canyon, with ledge upon ledge jutting out above these same strongholds, and ledge upon ledge jutting out below them; a thousand feet up to the trees, a thousand feet down to the water! *How came they there? And what for?*

We took some excellent photos of a ruin near at hand, and of two distant amphitheaters, and sometime an extended article must be written: it is impossible now, we are too tired and too distracted with trying to catch the abundant and strange flora as it passes.

J. G. LEMMON.

Fort Marion, Arizona, July 2, 1884.

A New Safety Lamp.

We have received a sample of a convertible safety lamp recently designed, and now placed upon the market by Mr. R. E. Astley, of Croxdale. The leading feature of the invention is the combination in the lamp of the Mueseler, Davy and Clanny principles, and the means of readily converting it into a lamp of either type at will, so suiting it to the varied requirements of mining operations. By the simple removal of a cone the lamp is adapted for general work on engine planes, for drivers, putters, wagon-way men, and men traveling in the returns or working waste work. Removing the cylinder and cone and inserting the top gauze, it produces a protective Davy lamp for testing for gas, such as is required by managers, overmen, and deputies, who do not require an open lamp to fire shots. Again the removal of the bottom gauze and the replacing of the cylinder and cone furnish a lamp that will give, the inventor claims, a light equal to any other glass lamp. It is a Mueseler lamp, but safer, Mr. Astley says, because there is no gauze to damage with a pick, etc., and so long as the glass is good the lamp is safe, which in an ordinary Mueseler lamp is not so, because the glass may be sound and safe but the gauze damaged and the lamp unsafe. Mr. Astley claims the following excellences for his invention:—Combined it is a lamp well suited for miners generally, and can be used in long-wall or broken workings where it is not safe to use a lamp depending for safety on the glass only. If the glass should break the lamp is safe, the gauze protecting the flame as in an ordinary Davy lamp; without the bottom gauze it is a lamp better in point of safety, sensitiveness and general adaptability, and having less gauze than any lamp at present in use; without the cylinder and cone, but with the top and bottom gauze, it is a lamp well suited for managers, overmen, deputies, and others who require a lamp to test for gas, the glass protecting the flame from the current: the safety of a mine is in proportion to the sensitive properties of the lamp in use and the number of square inches of gauze to which the flame is exposed. Mr. Astley also claims for his lamp that it is self-extinguishing on exposure to gas. It certainly is ingeniously designed, and by a man who knows by the experience of everyday life the precise requirements of such an invention; we do not doubt that it will receive attention from those for whose service it is produced.—*Colliery Guardian.*

Washington Territory Mines.

The Kittitas Mining Region.

A correspondent of the *Calico Print*, writing from Ellensburg, W. T., gives some interesting facts concerning the Kittitas mining region in that territory:

The Cle-elum mining district comprises the mineral lands lying east of the summit of the Cascade mountains, and generally speaking, that between Mount Stuart upon the east and the Snowqualmie pass on the west. The discoveries thus far made yield gold, silver, nickel and copper, and may probably be called the smelting ores. Prospecting accomplished to date has covered but a very limited scope of the district, and that only upon the surface. The principal properties now under location are the Copperhead, Bullion, Centennial, Black Honeycomb, True Fissure, and what is called the Hawk. These prospects are well defined upon the surface and yield by different assays from $17 to $400 per ton, in about equal proportions of gold and silver, 3 to 80 per cent copper, a trace to 36 per cent nickel, and $2 50 to $2,000 in silver. Last season having been principally occupied in tracing these lodes and making proper locations. But little is known of the character of these ores at any depth, except as in the case of the Bullion, which at 10 feet has changed from $3 50 silver and 80 per cent copper to 40 per cent copper and 13 per cent silver sulphurets. A huge magnetic iron lode runs through the entire district along side or in proximity to what is known as the red or porphyry formation, and between these the Copperhead lode has been traced from the Cle-elum river six miles northeast to contact with the granite formation at Mount Stuart. At several intervening points the Copperhead comes squarely to the surface, always with black oxide of copper on top and developing into what is called by some copper glance and by others gray copper, at limited depths. There is all along this lode at different points croppings sufficiently massive to run an ordinary smelter for years, and but little doubt exists as to the early development in this district of not only a rich but permanent smelting camp.

Centrally speaking, the Cle-elum District is distant but fifty miles from Ellensburg, the county seat of Kittitas county. Washington Territory, which is 150 miles from the Dalles, Oregon, its present river connection, and but 40 miles distant connection with steamboats at Priest's Rapids, the head of navigation upon the Columbia River. Between the Cle elum mining district and Kittitas valley are the Peshastin or Swank mining districts, as also the recently discovered Tenaway coal fields. In the former district one six-stamp mill and three arastras have been running for some six years upon gold-bearing quartz which has averaged from $20 to $30 per ton in free gold. Thus far the property has been in the hands of inexperienced persons, who have kept upon the safe side and have been content to work the ores for the free gold, while the richer sulphurets have gone down the creek. This season they put up a new mill with more complicated machinery for working the base rock, and for once the discovery owners have sunk upon their properties to a sufficient level to give them a full year's run overhead in their mine. Peshastin district is 40 miles distant from Ellensburg. In the Swank district, which is but 25 miles distant from the same point, the principal developed quartz property is upon a reddish formation running through the entire district in slate, and developing at several points into veritable mountains of quartz. Immediately upon the Homestake lode lies what are known as the Swank placers. From one creek claim some $50,000 is estimated to have been taken and from the contiguous high bars nugget gold has been drifted out weighing in single instances as high as $250 and $700. $1,100 in wire gold was taken from a single crevice in one of the high bar claims, and a man can make from $2.50 to $4 per day in the ground drifting for the coarse bed rock gold alone.

Three reasons have prevented the previous wholesale working of these high bars. First, the gravel is from eight to thirty feet deep and pay only being found in the gravel where the wash is extra heavy. Ground sluicing would not pay enough more to supercede the drifting process. Second, to procure and carry out water for hydraulic washing was considered almost an impossibility. Third, men working the creek claims would not allow the high bar locators to tail into the creek, thus making it necessary to "crib up" their tailings, which debarred the profitable use of water for even ground sluicing purposes. A company having succeeded in securing the creek ground for dumping purposes, and having secured a number of high bar locations, a survey was made and found that four miles of ditch or flume will bring water in abundance 150 feet above these locations, and after used at that point can be carried upon a body of hydraulic diggings in Kittitas valley. Of Kittitas valley I have already written you. Grain and all ordinary crops can be excelled nowhere either for certainty or yield per acre. In the valley are perhaps 2000 souls. Throughout the county several other important settlements are springing up. Ellensburg is temporarily and in all probability permanently the county seat. Four general merchandise houses, several lesser establishments, two newspapers, a national bank, a good hotel, etc., are the leading local features. In the county are five grist and sundry saw mills. In the county are perhaps 30,000 people. When afforded an outlet our population will be greatly increased. Climate very healthful; hot in summer but tempered by wind; cold in winter but rendered agreeable by continual calm, which enables us to make the most of two or three months' sleighing at our disposal. All natural advantages are yet untouched for the reason that under existing transportation conditions, we are not able to help ourselves. We have now two crops on hand and farmers are putting in a third. This is done upon the strength of the expectation that the Cascade division of the Northern Pacific Railroad will reach the valley soon. Should this expectation not be realized we will have to look to the Columbia River for an outlet.

Hoisting Appliances and Round Wire Rope.

From an exhaustive article on the subject, by R. J. Frecheville, of Cornwall Devon, we make the following:

Of all mining operations, none is more important than that of winding, or has undergone more changes and improvements during the last quarter of a century, especially in the coal-fields, where, in consequence of the increased depth and enormous output of the mines, great attention has been bestowed on this branch of mining engineering. In some instances, from 1,000 to 1,500 tons of coal are drawn from a single pit in a day, the cages running at a speed in the shaft of from 1,500 to over 2,000 feet per minute. This result is due, not only to the shafts being perpendicular, and powerful engines being employed, but also to the marked improvement of detail in the appliances used.

In Cornwall, the daily output of mineral through any single shaft seldom exceeding 100 tons, the rapid winding usual in collieries, is not required, nor indeed is it possible.

First of all, as pointed out by Capt. Charles Bishop, in his excellent paper read before the members of this Institute, in 1882, entitled, "On the Importance of Drawing in Deep Mines," too much care cannot be exercised in the construction of the skip-roads, and in putting in rolls of sufficient size to break the angles, those used in most of our mines being almost invariably too small. These skip-roads should be examined in every part at least twice every twenty-four hours. There is no doubt that our winding engines do not meet the ideas of modern practice. Their first cost and expense of erection are excessive. They are, besides, clumsy to handle. The type that has found favor in other districts is a double-cylinder, high-pressure engine, fitted with variable expansion and reversing gear, the pistons connected directly with the fly-wheel shaft, on which also are the drums and a powerful brake, worked by means of a counterpoise, or, better still, by steam, and capable of stopping the machinery instantly.

It is important that there should be a good lead from the drum to the pulleys. The angle made by the portion of the rope between the drum and poppet heads, and the portion hanging down the shaft should, if possible, not be less than 60 degrees. Another condition to be observed is to place the drum and its corresponding pulley in the same vertical plane. The pulleys for guiding the ropes should run loosely on their axles, so as to have a little lateral play, and be provided with a guard to prevent the rope from slipping. As Captain Bishop has remarked in the paper above referred to, there should never be such a thing as a hold-down pulley. The diameter of the drums and pulleys should not be less than one foot for every one-eighth inch diameter of the rope, and, in the case of ropes made of large wires, this proportion should be increased. The pulleys should be as light as possible, and of the same size as the drums, as it is not well to have a different strain on the rope, at the pulley from that at the drum. In the best constructed pulleys the central boss and rim are of cast-iron, and the arms of wrought-iron. The groove in the pulley should be lined with wood on end, and be sufficiently wide and deep to afford the rope a certain amount of play. The drum commonly used is the cylindrical one built of iron, with wood lagging bolted on to the metal work, thus forming a cushion for the rope to lie on. All bolts should have their heads carefully counter sunk. There should always be several coils of rope on the drum unwound, so that the rope cannot become unfastened.

The pulley frame or poppet heads should be well stayed and sufficiently strong to resist any strain that may be brought to bear on it. A hight of thirty feet with a slow winding of from 250 to 300 feet a minute, usual in Cornwall, is a sufficient margin for the engine-man when a reliable indicator is attached to the machinery. With this slow rate of speed, the adoption of any further appliances to prevent overwinding, such as safety or detaching hooks, is hardly required.

The rope to be used is a matter of the first importance, especially in those cases where the security of human life is dependent on its efficiency. The essentials of a good rope are flexibility and strength, combined with the least possible weight. Experience has shown that in the majority of cases these requirements are best fulfilled by round steel wire ropes. Iron wire ropes are fast going out of use, owing to the larger sizes required for given strengths, with consequent increase of dead weight to be subtracted from the useful load. It must, however, be borne in mind that, where the mine water contains much acid, the injurious effect of this on a steel wire rope would be greater than on an iron wire rope.

Too great stress cannot be laid upon the necessity of having ropes constructed of the best material. The selection of the material, however, somewhat depends on the conditions of working. Thus, with a perpendicular shaft and large drums and pulleys, a plow-steel wire rope will be found the most reliable; but with small drums and pulleys, and a shaft with angles in it, a rope made of best patent steel or mild steel will last longer, as the wires are not so apt to snap in bending. In describing a wire rope, the number of strands, the number of wires in each strand, their gauge, the quality of metal, and the material of which the center or case is composed, should be specified.

Now, as to the gauge, since the ultimate strength of wire increases as its diameter decreases, and since small wires are more pliable than large ones, it would seem that the finer the wire used the better; but there is a practical limit to this, as very fine wire offers too much surface for oxidation, and is too easily injured by friction. Experience has shown that it is advisable to employ medium sized wires, between Nos. 10 and 15 of the Birmingham wire gauge. For ordinary work, hemp cores or centers have been proved the best. They stretch with the strands, allow the wires to bed themselves solidly, and give ropes greater flexibility than could be obtained with wire centers. The latter have not given very satisfactory results in practice, although a greater breaking strain is obtained with a relatively smaller rope.

On account of many different varieties of steel wire employed in the manufacture of rope, and the varying sizes of the hemp centers, and the empty spaces, it is impossible to state a formula for determining the dimensions of a steel wire rope required to bear a given strain, as the nature of a wire rope, however, is defined by the number and size of the wires, it is easy, if we know the section and weight per fathom of the gauge employed, to determine the effective sectional area of the rope and its weight per fathom given, then, the quality of the metal, the breaking strain of the rope can be approximately estimated.

As the operations of manufacture introduce so many elements of uncertainty in wire ropes, it is well to allow a wide margin of safety, especially where their breakage would endanger life, and take the working load at 1-10th of the ultimate strength or breaking strain. The weight of the rope hanging over the pulley at the poppet-heads is of course included in the working load. In very deep mines, this weight, even with steel wire ropes, becomes a matter of such serious consideration that tapering ropes have to be used. In the case of a rope working at a very slow speed, such, for instance, as a capstan rope, a larger factor of safety than 1-10th may be adopted.

Nevada Resources

In an interview in New York with George W. Cassidy, editor of the Eureka *Sentinel*, the *Mail and Express* reporter elicited the following points: It has been generally understood in the East that since the productive bonanza mines have failed, Nevada had deteriorated in population and in wealth to such an extent that she was unable to support a State government, and that the property holders would ask that she be reduced to a Territorial condition. In answer to this Mr. Cassidy said: "There is no such talk or feeling in Nevada. While our State rate of taxation is not oppressive we have in the treasury about $700,000, and we do not owe a dollar. What other State can make this showing? I see the bonds of your States quoted daily in the Wall street market. We have never cost the other States or the Federal government one cent. Neither do we get a dollar for alleged river and harbor improvements, and other jobbery, though we are taxed to foot these outlays for the other States. Nevada has contributed from her mines one thousand millions of gold and silver to uphold the credit of the nation. In all respects we are in a better condition than those who traduce us. In proportion to population we name a less number of illiterate people than any other State, and the percentage of crime and drunkenness is less.

"It is not true that we are losing our population; on the contrary we are gaining in all directions. Nevada was admitted into the Union in 1864 with a total population of less than 30,000. In 1870 we had 52,000, and according to the census of 1880, 62,000. The State embraces 111,000 square miles, being as large as all New England, New York and Ohio combined. The compensation allowed for taking the Federal census will not pay for horse feed in that country; so one-third of the people are never reached.

"Mining is hardly as prosperous as formerly, but our people are giving more attention to stock raising and agricultural pursuits than in the past. There are six fertile valleys in the State, any one of which is as large and productive as the largest of one of the New England States. Mining will be carried on profitably for a century to come."

THE estimate of the Department of Agriculture of the wheat crop for this year is about 485,000,000 bushels.

MECHANICAL PROGRESS.

Wire Gauze Stove Doors.

The person who ten years ago, says the *Age of Steel*, would have recommended a well-ventilated stove oven to the kitchen workers would have been set down as an unconditional fool in the school of cookery. People who have never cooked except in closed ovens cannot be persuaded except by actual demonstration of the fact, that bread and meat can be cooked perfectly in an oven wherein the heat is being constantly displaced by fresh atmospheric air. They are inclined to ridicule the idea because of its radical departure from established custom and popular conviction. But, nevertheless, the ventilated oven is coming into wider use; and it is this which compels attention.

The ventilated stove oven is with us no hobby; our attention has been drawn to it by the experiments which a large stove manufacturing company has been carrying on; these have satisfied us of its value, but have not convinced us that it is our bounden duty to hammer other people into our way of thinking. Our interest in the new invention is of that impartial kind which declares for fair play and then abides the result.

The wire gauze door is, we believe, the only method yet hit upon by the friends of ventilated ovens for admitting the fresh air, though we understand an Eastern manufacturer proposes to bring out a stove in which the draft will in some way be made direct from the oven to the flue, and from the outside into the oven, in a new and unexplained manner. With the wire gauze door the hot air escapes through the upper part of the door and the cool air flows in through the lower part, according to natural laws. The result is the bottom of the stove upon which the cooking is done is kept comparatively cool. One would think that even with a good fire going it would be difficult to bake bread or roast meat. But it is not, and the hot air escaping from the oven need cause no alarm.

One advantage claimed for the ventilated oven is that it prevents a great wastage of the moisture contained in the meat or whatever may be cooking, and thus insures tenderness as well as greater weight. In the closed oven experiments show that a piece of meat loses 30 to 40 per cent of its weight, if well cooked, by absorption. In the ventilated oven the loss has frequently been as low as 10 per cent, and rarely, if ever, in excess of 15 or 20 per cent. In other words, it appears that the meat in the closed oven is dried rather than cooked, and is made the tougher because of its treatment. The originator of the wire gauze oven doors, it may be said, declares that he can take the cheapest and toughest steak in the market and cook it in the ventilated oven, with the result of making it as tender and juicy as the best porterhouse. He is emphatically of the opinion that meats cooked in the oven are made tough and indigestible by the dry heat, which robs them of all moisture.

Welding Fluxes.

We do not know that the following welding fluxes are any better than the welding material used generally by watch makers and silversmiths, but they have been patented in England, so we publish them.

1. A welding-material composed of 25 parts by weight of borax, a paper or metallic support, and 60 parts of metallic filings of the same nature as the metals to be welded, and made by first melting the borax; second, immersing the support in the fused borax; third, smoothing the same by passing it through pressure rollers; forth, sprinkling its two faces with the metal filings; fifth, heating the sheet in an oven; sixth, passing through pressure rollers.

2. A welding material composed of borax and of metallic filings of the same nature as the metals to be welded, mixed with the fused horax, and in the proportions substantially as set forth, and then rolled out into sheets of about one sixteenth of an inch thick.

3. The welding sheets coated with a layer of gum lac or other appropriate varnish.

The following compound has been frequently offered as a trade secret: The copperas, 2 oz.; saltpeter, 1 oz.; common salt, 6 oz.; black oxide of manganese, 1 oz.; prussiate of potash, 1 oz. Pulverize these ingredients and mix with them 3lb. of nice welding sand.—*Scientific American.*

Lathe Feeds.

For many years our tool makers have almost universally discarded other feeds for lathes for the screw. Forty years ago, and later, the chain feed was a favorite for all work on the lathe but screw cutting. It had its advantages. So had the rack and pinion feed. Both these feeds took hold of the tool carriage midway between the V-ways, the proper point to avoid a diagonal strain. The rack protected its teeth and those of its pinion from falling chips and dirt, and it could be instantly reversed without much backlash. With it the carriage could be run from end to end of the bed between the heads very rapidly. In fact, many of the screw feed lathes of to-day have their run-back or traversing movement by means of a gear engaging with the threads of the screw, which thus serves as a rack.

As the best of toothed racks and gears are now cut, there is no need of any backlash; the epicycloidal curve to form the contour of the teeth insures a perfectly free rolling action, without looseness. Such a cut rack with pinion or wheel would be just as accurate for the finer qualities of lathe work as the screw; and with properly arranged gearing such a feed could be used in screw cutting. In fact there would be some advantages for some jobs in having a rack and pinion feed instead of the present screw feed. If there should be fear of sufficient wear of the teeth by use to create a backlash which might affect the integrity of the proposed screw, a double-disk pinion would obviate this fault.—*Scientific American.*

PROGRESS IN ARTILLERY.—Scarcely 25 years ago the most powerful piece of artillery was a 68-pounder, throwing its projectile with a velocity of 1,600 feet per second. Now the weights of guns have been increased from 5 to 100 tons, the velocities from 1,600 to 20,000 feet per second, the energies from 1,000 foot-tons to over 52,000, and the projectiles from 68 pounds to 2,000 pounds. But, enormous as these attainments are, expressed in figures, the highest or greatest are as nothing when compared, as some one has remarked, with those of the projectiles, velocities and energies existing in nature. Basing the estimates on the principles laid down by Helmholtz, if the earth, for example, be considered as a huge projectile, and if it could be possible to utilize the whole of the energy stored up in gunpowder, there would be required a charge 150 times greater than its own weight and 900 times greater than its volume to impart her orbital motion to the earth.

THE PERFECT SCREW.—Professor W. A. Rogers produces a perfect screw by the following process: An ordinary well constructed lathe is used; and cuts of various depths are taken on a preliminary screw, for the purpose of tabulating the errors of the leading screw of the lathe as compared with a standard measuring bar. This being done, a micrometer screw is used to vary the relation between the leading screw and the cutting tool. This screw is kept moving automatically, or by hand, so as to always correspond with the tabulated values, which results in producing a screw nearly free from the errors of the leading screw. This screw is then ground with a nut cut in the same way: and, if not sufficiently perfect, it is then put in the place of the leading screw, and another screw cut from it by the same method, whereby any remaining errors are eliminated.

LIME IN BRICKS.—Many bricks become spoiled when they are made from clay which contains lime in such quantity that, after burning, the lime becomes hydrated sooner or later, and thus renders the brick useless. This may be prevented by placing the bricks, as soon as they are removed from the oven, when they are still warm, in a hole or tank piled on each other, and throwing water over them so as to cover them entirely with water. A few hours afterwards, when bubbles no longer come to the surface, the bricks can be taken out of the water. By this operation the slaking of the lime, which takes place in bricks not thus treated by the slow absorption of the humidity of the air, is prevented, as the lime is modified by this operation.

A STEAMER TO RUN UNDER WATER.—There is being built at the Delamater Iron Works an iron steamboat designed to run under water. It is 30 feet long, 7½ feet broad and 6 feet deep. Water ballast under control of the crew will enable them to sink or float her, and by the device of two rudders whose planes are at right angles to each other, she can be pointed in any direction. The usual outfit of electric engines, compressed air and diving suits, with which readers of Jules Verne are familiar, is included in the design. In war times she can also be used as a torpedo boat.

ROLLING MOLTEN IRONS.—A rolling mill has been devised for rolling molten iron or steel in a liquid state. According to this, the rolls are cast hollow, so as to receive a current of water, which will maintain a sufficiently low temperature, and the metal is to run from a "hopper" or distributor and fall between the rolls, becoming cooled on contact with them. The effect of this process, it is said, is to free the metal entirely from gases.

PURITY AND CRYSTALLIZATION.—The characteristic sign of purity in metals is their power for crystallization—the purer the metal the more ready and perfect the crystallization, and the less is its cohesive strength. Zinc when quite pure cannot be rolled into sheets, but when mixed with a small percentage of lead it becomes very ductile. Gold has to be alloyed with copper or silver to make it suitable for use in arts or commerce.

THE TENSILE STRENGTH of a cast-steel bar is 140,000 pounds, wrought iron bar 50,000 pounds, malleable cast-iron 25,000 pounds per square inch. Small steel castings can be annealed in the same manner as steel forgings, by heating to a full red, covering with hot ashes, allowing three or four hours to cool.

THE FIRST IRON PLOW.—The first cast-iron plow was made in 1797 by Charles Newbold, of Burlington, New Jersey, who spent $30,000 in perfecting the implement.

SCIENTIFIC PROGRESS.

How Petroleum Tanks are Fired By Lightning.

The great destruction of petroleum in oil storage tanks through strokes of lightning, is calling the attention of scientists and practical men to the necessity of learning how the lightning is directed to the tanks and what can be done to avert the danger. During the months of May and June last, no less than seven distinct and separate occurrences of this kind occurred in the oil regions of Pennsylvania, with an aggregate loss of 188,300 barrels of oil, involving a pecuniary loss of about half a million of dollars. Mr. Thomas H. Walton, writing to the Philadelphia *Record*, thus explains the peculiar attraction which petroleum tanks manifest for lightning:

Light a tallow candle and let it burn till it requires snuffing. Don't snuff it, though; but light another candle. Get into a still atmosphere and put out the first candle, leaving the long snuff. A column of smoke will arise from it. At a height of several inches in this column of smoke put the flame of the lighted candle. You will see a messenger of flame decend through the column of smoke and relight the lower candle. Well, what of this? Simply let us change the candles into some other inflammable substances. Let the lower one be an oil tank, containing 20,000 or 40,000 barrels of coal oil. Let the upper one be a cloud charged with a superabundance of electricity, which is becoming released by flashing to the earth while the barometer is dropping very rapidly. What then? Coal oil under certain atmospheric pressures will contain a certain quantity of carburetted hydrogen gas. If the atmospheric pressure should suddenly become reduced, then the body of gas in the oil, being relieved of a certain amount of pressure, will expand. A proportionate quantity of the gas will get out of the oil and into the air, mixing with it in a corresponding ratio. The body of air receiving this gas to the extent of four per cent will take the fire of electricity and ignite with the violence of an explosion; and the body of air receiving such a light gas will form itself into a column and ascend from the tank to the clouds in an invisible stream. We do not need to be told of the result if the clouds are low, and are also flashing fire from them. To avoid accidents from lightening, the tanks should be thoroughly ventilated, so that the air on the surface of the oil will be so pure as not to contain more than one-half of one per cent of the coal gas. If covers are used on such tanks they hinder the gas from escaping freely as it forms; and then on the surface of the oil there will be an atmospheric explosive mixture, requiring only the presence of a flame of any kind to start a conflagration.

A Polar Tempest.

It is impossible to form an idea of a tempest in the polar seas. The icebergs are like floating rocks whirled along a rapid current. The huge crystal mountains dashed against each other, backward and forward, bursting with a roar like thunder, and returning to the charge until, loosing their equilibrium, they tumble over in a cloud of spray, upheaving the icefields, which fall afterwards like the crash of a whiplash on the boiling sea. The sea gulls fly away screaming, and often a black, shining whale comes for an instant puffing to the surface. When the midnight sun grazes the horizon, the floating mountains and the rocks are immense in a wave of beautiful purple light. The cold is by no means so insupportable as is supposed. We passed from a heated cabin at thirty degrees above zero to forty-seven degrees below zero in the open air without inconvenience. A much higher degree becomes, however, insufferable if there is a wind. At fifteen degrees below zero a steam, as if from a boiling kettle rises from the water. At once frozen by the wind, it falls in a faint powder. This phenomenon is called sea smoke. At forty degrees the snow and human bodies also smoke, which smoke changes at once into millions of tiny particles, like kneedles of ice, which fill the air and make a light continuous noise, like the rustle of a stiff silk. At this temperature the trunks of trees burst with a loud report, the rocks break up, and the earth opens and vomits smoking water. Knives break in cutting butter. Cigars go out by contact with the ice on the beard. To talk is fatiguing. At night the eyelids are covered with a crust of ice, which must be carefully removed before one can open them.

Changing the Color of Flowers.

Our knowledge of the chemistry of vegetable pigments is not yet sufficiently advanced, for which reason the effect of artificial influence upon the color-tone of flowers has not yet received its merited attention. According to my view, tannin is an important factor in the generation of vegetable colors. It is found in almost every plant, the petals not excepted, and by the action of the most varying reagents—alkalies, earths, metallic salts, etc.—it assumes the most manifold hues from the pale rose to deep black. A darker color is produced in flowers rich in tannin, when manured with iron salts, dye black and produce ink. A practical use has been made of this fact in the raising of hortensias and dahlias. The former, which, in ordinary soil, blossomed pale-red, become sky-blue when transplanted into soil heavily manured with iron ochre, or when occasionally watered with a dilute alum solution. English gardeners succeeded in growing black dahlias by similar manipulations. It is well known to every florist that a change of location, that is a change of light, temperature and soil (replanting occasionally produces, new colors whence it may be deducted that an interrupted nutrition of the flower may, under circumstances, effect a change of color. We see no valid reason why the well authenticated fact of the change of color produced by manuring with iron oxide thereby changing the nutrition of the plant, should not be practically employed by the hothouse gardener.

Another very singular and successful experiment in producing a change of color in a bird has recently been made. A breeder of canary birds conceived the idea of feeding a young bird with a mixture of steeped bread and finely pulverized red Cayenne pepper. Without injuring the bird, the pigment of the spice passed into the blood and dyed its plumage deep red. The celebrated ornithologist, Russ, believes that the color of the plumage of birds might be altered according to desire by using appropriate reagents.—*Popular Science Monthly*

A distinguished botanist has found that by simply soaking the stems of cut flowers in a weak dye solution there color can be altered at will without the perfume or richness being destroyed. Most beautiful effects are produced by preparing lakes. Singular to say, flowers refuse to absorb certain colors, while they dispose of others in different manners. If placed in a mixed solution they make a complete analysis, and some lilies which had been treated with purple showed distinct red and blue veins, the colors having been divided in the process of absorption.

GARDENING EXPERIMENT — STIMULANTS FOR PLANTS.—A correspondent of the *Gardeners' Chronicle* has been making some interesting experiments in the use of special stimulants for plants, which are referred to as follows: "Last year I was induced to make an experiment in chrysanthemum growing, and for this purpose I bought one pound of sulphate of ammonia, which I bottled and corked up, as ammonia evaporates very rapidly. I then selected four plants from my collection, and put them by themselves, and gave them a teaspoonful of ammonia in a gallon of water twice a week. In a fortnight's time the result was most striking, for although I watered the others with liquid cow manure they looked lean when compared with the ammonia watered plants, whose leaves turned to a dark green, which they carried to the edge of the pots until the flowers were cut. As a matter of course the flowers were splendid. The ammonia which I used is rather expensive, as I bought mine from a chemist's shop; this year I intend getting agricultural ammonia, which is much cheaper. I have also tried it on strawberries, with the same satisfactory result, the crop being nearly double that of the others; it is very powerful, and needs to be used with caution.

A GENUINE MARBLE MANTEL, costing from $1,500 to $2,000, can be imitated in slate so perfectly, at a cost of from $40 to $50, that the most fastidious could have no choice between them. The process of marbleizing requires skill, but is comparatively inexpensive. The enameling is done on water and afterwards subjected for a time to heat, at a temperature of 300°; this makes it as hard as flint, bakes it into the slate, forming a smooth, bright, glazed surface, which is not acted on by acids or grease. The durability of this surface has scarcely been tested; marbleized mantels have been in use thirty-five years, without showing any signs of the surface cracking or wearing, or of its losing its color and luster.

THE CULTIVATION OF FLOWERS is now urged from a purely scientific basis, especially in low or unsavory localities. The perfumes of many or most flowers convert the oxygen of the air into ozone, which has a powerful oxidizing effect upon decaying matter, and is therefore of great economy in matters of health. The most odorous flowers should be planted for this purpose, such as mignonette, alyssum, heliotrope, perennial pinks, lilacs, etc.

GAS VERSUS ELECTRICITY IN LIGHTHOUSES.—The experiments carried on at South Foreland, England, detailed at some length in the *Journal* of July 2d, in regard to gas, electricity and oil as agents for lighthouse illumination, appear to have settled the question that gas light is the one best calculated for use in decidedly hazy weather.

LONG DISTANCE TELEPHONING.—Conversation is carried on daily between New York and Boston through copper wires, which are reserved for experimental use exclusively. The *Electrical Review* says it is believed, before many months, commercial lines will be in use between several of the large cities of the country.

THE ELECTRIC DOT.—As the result of some very careful tests recently made, it is estimated that an electric dot travels at the rate of 16,000 miles per second, or 9,600,000 miles per minute. This is not quite up to the speed of light, which travels 12,000,000 miles per minute.

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Passing Events.

From the mining regions there is little news of moment, aside from what we report in our usual summary of mining news for the week. There is some little excitement about the New River mines, in Humboldt county, in this State, but it is mainly local. All the flurry about the Coeur d'Alene mines seems to be over. The men who remain in that part of Idaho are only a portion of those who went to the new mines. It will take money to develop many of the claims of that region.

The strike in the Quijotoa mines, in Arizona, is making some talk, but has created no special excitement. The recent strike in the Stafford mine, belonging to the Sweetwater Co., at White Pine, Nev., has again attracted attention to that once famous camp. The strike is believed to warrant expectations of another bonanza.

Politics are taking up a great deal of attention in these days, and general business matters are somewhat dull in consequence.

THE dispute concerning the jurisdiction to which the Coeur d'Alene mining region belongs was decided recently by Judge Buck in favor of Shosbone county, I. T. The honest miner will now have to go to Pierce City for county seat business.

Fastening Caps on Fuse for Blasting.

If miners generally will pay careful attention to fixing their caps on the fuse when blasting with high explosives they will get much better effect from their blasts than is always the case. Very few appreciate the importance of this point, and it is the object of this article to explain it.

It is a common custom to secure the cap on the fuse by pinching the cap-shell or by biting it between the teeth—a dangerous practice, which has resulted in a number of accidents. Other miners simply push the cap on to the end of the fuse, thinking that as long as it does not fall off the result will be the same. But this is not the case. The more firmly the cap is pinched on to the fuse the better the detonating effect of the fulminate of mercury in the cap, and the more complete and sudden the decomposition of the powder. This has been fully proven by careful experiments.

Some time since complaint was made by Eastern purchasers of caps made here, that they did not get good results. Some of the caps did not go off, and others did not do the execution expected. The local makers were puzzled at this, as there were no complaints here, and experiments were made to find out the cause.

It was found, in the first place, that Eastern and European fuse was somewhat smaller than that made here. The caps made to use on California fuse, therefore fitted loosely on the Eastern fuse, and when the cap was fired, sometimes even the shell was not broken. In others the fire would burn down slowly until heat enough was developed, when the cap would explode, but with comparatively small effect. In fact, though paying for a triple-force cap, they were only getting the benefit of a single-force one. This led to a lot of other experiments about loose caps on the fuse. They resulted in proving that a cap not properly secured to the fuse lost something more than half its power. They found that a double-force cap, well secured, would do almost as good work as a triple one. It is therefore urged upon all users of such caps to secure the cap well with suitable nippers, of which there are several kinds in the market. The nippers cut the fuse, point it so it will go in the shell easily, and also forcibly nip the upper end of the cap-shell on the fuse, so there can be no escape of gas. This makes the caps waterproof, also. So well is this understood by some mining men that special people are employed to prepare caps and fuse for miners. Superintendent Patton has a boy who does nothing else at the mines in his charge, and it is found to pay well.

When the fuse is too small, or the cap is fitted loosely and not squeezed on, the cap loses from 30 to 60 per cent of its force. The gases escape from the cap or shell alongside the fuse. The fulminate of mercury in the shell requires "tamping," so to speak, just like nitroglycerine and other powders, to give its best effect. Anyone can try this by unwrapping one of the tapes from a piece of fuse, which reduces its size; then put on the shell. The fuse "spits" ahead and will sometimes blow the cap off without firing it; and when it does fire it a comparatively small effect is given.

One of the experiments to prove this was made with a piece of one-sixteenth wrought-iron plate. Where a cap was simply pushed on to the fuse loosely and fired, very little impression was made on the plate. When the cap was pinched tightly on to the fuse, so its contents were confined, a round hole was blown clear through the iron by the cap. Caps and fuse were, in each instance, of the same make.

It is well understood that the more powerful the explosion on the high-grade powders to discharge them, the better are the results, and it is in the interest of economy and good work that miners should firmly and tightly secure their caps on their fuse. There will be fewer mis-fires and better execution in blasting.

THE case of the Mono Gold Mining Co. against the Rustler Mining Co., in regard to the possession of certain mining land, which has been in the courts for five years, was settled this week. Some time since the demurrer of the Rustler Co. was overruled and no answer has since been filed. Judgment for the plaintiff in $20,000 by default has accordingly been rendered by Judge Sawyer.

THE local manager of the Lexington and Princeton Mining Companies of Butte, Montana, has left, it is said, with $10,000 of the Princeton's money.

Artesian Wells in Nevada.

A very deep well is being sunk at White Plains, Nevada, on what they call the 40-mile desert, in the neighborhood of the sink of the Humboldt. The well is being put down by the Central Pacific Railroad Co. as a test well, not alone for the satisfaction of obtaining water for their own use, but to determine the feasibility of getting it elsewhere on the line of their railroad, as well as in other parts of the State. The only good supply of water for the desert is brought from the Truckee river, 35 miles west of the new well on White Plains, and is hauled in tank cars for the supply of engines and domestic purposes, showing the necessity of testing thoroughly by artesian wells to get water. The desert contains many specimens of Indian curiosities—arrow heads, Indian mortars, etc., being formerly fine hunting grounds.

A record of the progress of this well will be of interest to many persons. They have found salt, water, hot water, and finally, at a depth of 1,650 feet, they came across wood. Mr. W. C. Chapin, who has charge of the drilling of the well, sent to the Academy of Sciences samples of the wood brought up by the drills, and gave a brief record of the material passed through in boring.

From the surface to 20 feet they passed through clay with a four inch stratum of fine decomposed quartz; then to 36 feet it was tufa and cement; then two feet of cobbles, sand and hard shells. At 38 feet they struck a strong stream of salt water in gravel; from 40 to 70 feet there was sand, cement with seams of rock and cobbles. This kept on until they reached 144 feet, when they met cement clay, with sand and gravel, which continued to 205 feet, when they met fine brown sand; then down to 300 feet there was cement, gravel, sand and shell conglomerate. From 300 to 340 feet compact sand or sand rock; to 367 feet various kinds of cobbles; then followed white tufa, fine sand, cement, sand and gravel to 400 feet. A stratum of conglomerate was then found, which passed into cement at 420 feet, where cobbles and gravel were met with, and then fine sand; at 486 feet bedrock was found. Eight inch driving pipe was driven to the depth of 486 feet, the part above this being all surface wash. From 486 to 520 feet was black rock, when red volcanic rock was met, continuing with slight change to 575 feet, where black basalt was found. At 595 feet there was red rock and red mud; then came black rock with seams of clay. From 625 to 635 feet there was a reddish-gray rock with cement, which mixes up with the water—red rock probably from above. Gray muddy rock then came in, and from 655 to 665 feet a reddish-brown sand rock; then a soft green rock. Between 666 and 685 feet there was very compact black sand, and then hot water was struck.

Between that point and 697 feet was reddish-black sand, changing to coarser below, when at 703 they found red rock again, which continued to 745 feet. From there to 950 feet was black, red and gray rock, in strata. From there to 1,000 feet, and to 1,040 feet, was red rock, fine and very hard. From 1,040 to 1,050 the rock was slate-colored. From that to 1,140 black (basalt), and then a red slaty clay, followed by blue clay (slate) and volcanic ash. The volcanic ash continued to 1,300 feet, when conglomerates and rock were met, lasting to 1,550 feet, when a soft, muddy, white rock came in, continuing to 1,610 feet.

From 1,610 to 1,615 feet was a fine gray sand, and from 1,615 to 1,624 was a stratum of *wood*. This wood is not silicified, but is black and hard, though it breaks readily when handled. Some large pieces were found. It is rather remarkable to find wood at such a depth, and so thick. Iron pyrites were found near by. Below this, again, is conglomerate, with some fine sand. At 1,825 feet very muddy rock came in, and also more sulphurets, followed by a soft, dark rock, very loose, and falling in on the drills. From 1,890 feet to 2,088 feet very hard black rock was met. The well is now down over 2,100 feet, but no water has yet been found, aside from that which is hot or salt, as mentioned.

The work of sinking is, however, being continued, with the hope of eventually striking a flow of water.

A FLOCK of wild geese, going south, passed over San Diego the other day.

Ambulances and Mining Accidents.

They have an association in England now, called the "Ambulance Association," which operates in the thickly settled mining districts. The object is to care immediately for persons injured by mining accidents, and where they occur, to provide for proper conveyance of the sufferer to a place where he may be properly cared for. It seems that in many instances where men are hurt they are injured by unskillful people carrying them. Ambulance material is provided in mining districts, and those injured are taken on suitable appliances, so they are not hurt worse by being carried on boards, shutters, or anything handy. In the coal and iron mining districts in Great Britain there are some 560,000 men and boys employed, and that one relief society alone in one year assisted 14,929 injured cases, and last year (1883) out of a total membership of 224,000 belonging to the various societies in the mining centers, no less than 44,379 cases of injuries were relieved. Lord Crawford and Balcarres, a high authority on these matters, stated at an ambulance meeting at Wigan some time ago, there could be no doubt that as many as 100,000 accidents, large and small, occurred throughout the mining districts of that country in one year. Surely, then, with so much pain and suffering to alleviate, there is abundance of good work to be done by proper means of carriage for the injured.

The association is intended to relieve pain and suffering among the mining population by assisting in the introduction of well-regulated means for the carriage of the injured everywhere among the collieries and iron works. An exhibit of ambulance material for this purpose was made at the recent International Health Exhibition, and attracted a great deal of attention.

Emery.

Emery and corundum are nearly allied mineralogically, though in trade they are sharply distinguished. Mineralogically, corundum is a nearly pure alumina, while the emery contains a very large proportion—from twenty to thirty-three per cent—of iron oxide. The trade distinctions are somewhat as follows: Emery is always black, while corundum is of various colors, though more frequently gray, and is never black. It is much harder than emery and sharper, cuts deeper and more rapidly, but is, on the other hand, more brittle and less durable.

Almost all our supply of true emery is imported. Many supposed discoveries of emery of good quality have been made, but all have failed to stand the commercial test. Magnetite, ilmenite and massive garnet are often mistaken for emery, and attempts have even been made to replace true emery for these substances.

For sometime emery was produced at the well known mine at Chester, Mass., but the material was found to be too soft, and the mine is now abandoned. It comes from Turkey, near Smyrna, and the island of Naxos. There are other foreign localities also, though none except from the places just mentioned comes to this country. We import annually into the United States, about 45,000 hundred-weights, worth about $58,000, of the crude emery ore which is found here, and about $30,000 worth of ground emery prepared in England. The average price of Turkish emery, ground in this country is, grain 3½ to 6 cents per pound. That of the best English ground is worth: grain, 10 cents per pound; flour, 8 cents per pound.

DURING 230 days the 30-ton smelter of the United Verde Copper Co.'s plant, Arizona, has turned out 2,300 tons of copper, or an average of ten tons per day. The aggregate contained about 175,000 ounces of silver. The company has paid $97,500 in dividends, besides paying for their plant and improvements and building roads, etc., with a large reserve fund on hand.

L. VARY, Justice of the Peace at Bartlett Creek, tells the *Silver State* that miners from California have discovered nickel mines out in the Black Rock country, which are said to be very rich. The ore is said to be exactly like that from the Cottonwood mines east of Lovelock.

MR. G. W. INGALL is authorized to take subscriptions for the MINING AND SCIENTIFIC PRESS at Phœnix, Arizona.

THE Bonanza King mine at Calico has reached a depth of 550 feet, and work is progressing on the seventh level.

Shaft-Sinking by Freezing.

This new system of shaft-sinking in water-bearing soils, differs from all other known methods, in the transformation of this soil from a liquid to a solid state, instead of the usual attempt to drain the shaft by pumping.

The necessity for a pumping plant is avoided, and the danger, as well, from the fluid condition of the surrounding ground. The sinking is carried on as in solid ground, and there is no fear of pressure upon the sides or from the bottom of the shaft, because the soil forms one homogeneous mass, and slips are impossible. M. Poetsch solidifies the fluid soil by congelation, brought about by sinking a system of tubes in which circulates a saline solution of very low temperature. By this simple method he reduces the temperature of the earth to 19 C'ent. (22° Fahr.), and gives it the solidity of sandstone, a conchoidal fracture, and all the properties of stability due to a mineral substance.

Before putting this process into practice (it is patented in Europe and the United States), M. Poetsch made the following experiments: He poured into a box, placed upon the surface of the ground, about five cubic yards of semi-fluid earth; in this box was arranged a system of pipes, connected with an ice machine. Through these pipes a saline freezing solution was circulated, and by meaus of a thermometer the temperature was obtained at varying distances from the pipes. At the end of eight days the entire cube of earth was frozen solid, and when the sides of the box were removed the mass resembled sandstone in its hardness.

This first attempt having demonstrated the possibility of realizing his idea, the inventor decided to test the method upon a grander scale. The Douglass Company, at Aschersleben, graciously put at his disposal the Archibald ligaite mine, near Schneidlingen. The description was translated for *Engineering News*, from *Zeitschrift fur Berg., Hutten, und Salinenwesen in Preussischen Staate*. A shaft, with a retilinear section of 15 44-100x10 3-10 feet, had been sunk through 101½ feet of solid earth, and was only separated from the underlying bed of lignite by a water-bearing stratum 18 feet thick. An attempt had been made to pass this by sheet-piling, but it had been found impossible to sink more than 4½ feet below the line of the water. To furnish an outlet for the incoming water, a drill-hole has been bored, in the center of the well, to the lower galleries already driven in the seam. The effect of this hole was to create a continuous current of water, which made the freezing method much more difficult of execution.

M. Poetsch sunk, to the bottom of the shaft and about 20 in. into the lignite, 23 pipes, each 0,200 m. (7⅞ in.) in diameter; 10 of these pipes were placed against the sides of the shaft. They were fitted to their lower end, and inside with a conical coupling, in which was placed, from bove, a wooden plug shutting the pipes at the bottom. This joint was made perfectly tight by pouring at the bottom of the pipes, successive layers, of 2 in. thickness each, of cement, plaster and moistened clay, the whole covered by a bed of asphalt and an iron washer, properly adjusted. In the interior of these pipes are placed other pipes, 39 millimetres (1.18 in.) in diameter, open at the lower ends and held in place by tubular fittings and stuffing boxes at the upper ends. The inner pipes communicated with a common pipe at the upper ends, and another pipe connected all the outer tubes. The saline solution was driven into the inner pipes, and ascended in the annular space around them, and this in circulating lowered the temperature of the surrounding soil. This system of pipes communicated with a Carre ice-machine, placed upon the surface of the ground above, by means of two pipes, one of which, connecting with the inner tubing, carried off the cold liquid leaving the machine and forced downward by a pump, and the other carried down to the refrigerator the liquid which had passed through the circuit.

The saline solution used had a base of chloride of calcium, of which the freezing point is at 40° below zero, Fahrenheit.

So as to be able to observe the temperature of the earth, 20 pipes are sunk at the bottom of the well and near the sides, at different points, near the freezing-pipes. These pipes 20 feet in length and of small diameter, were closed at the bottom and filled with a solution of chloride of calcium; they were fitted to receive a thermometer. Observations were made daily.

The shaft, by reason of this freezing, was perfectly dry, and the once fluid soil was as hard as sandstone; the sinking was done, consequently, with the pick, point and hammer, without the use of sheet-piling of any description. The shaft was timbered, however, for each meter (3.28 feet) sunk. On September 30, 1883, the coal was reached; this also had frozen to the depth of one *meter* below the pipes, the overlying sand was thoroughly united, by the congelation, to the coal beneath, in such manner that fragments detached by the pick were partly coal and partly frozen sand; separation rarely took place at the plane of contact of the two materials.

When the sinking was completed, horizontal trenches were cut about twenty inches above the coal out into the congealed earth. It was proven by an examination with the thermometer, that the ground was frozen around each pipe in a circle of about five feet in diameter. Other measurements demonstrated the fact that the thickness of the block of ice increased with the depth.

Notwithstanding the unfavorable conditions, the first application of the Poetsch method was perfectly successful, as attested not only by the Director of the Archibald mine, but also by many engineers who visited the works.

In new works undertaken by the inventor, he commences by filling the shaft to the water level with gravel, in case previous sinking has brought the work below that level. The method of putting in place the freezing pipes varies with the location. When the fluid soil has a slight thickness only, and the shaft is already sunk to the water level, the pipes are simply forced into the sand by a sand pump working inside. This was the system actually employed at the Archibald mine and at the Max mine, near Michalkowitz (Upper Silesia).

When the force of the liquid soil is considerable, a boring machine is used, which puts down four pipes at a time, and is worked by the Schonebeck water-jet system. If the fluid soil is not at a great depth below the surface, the pipes are arranged in such a manner that a shaft of the desired dimensions can be sunk inside of them. But when the water stratum is at a great depth, and the sinking of the holes would be too costly, the shaft must first be sunk to water level with a diameter about one *meter* greater than the finished diameter; this larger shaft is timbered, and the freezing pipes sunk inside. If the water-bearing stratum encloses boulders, etc., of considerable dimensions, the holes are either inclined to avoid them, or they are removed altogether, or they are pierced through by special apparatus.

In comparing finally the Poetsch system with previously known methods of passing fluid soils, we are forced to admit that this alone permits an accurate previous estimate of cost and time of sinking. The principal advantages are:

1st. The assurance of a perfectly vertical and rapid sinking of the shaft; as if the work was done in solid ground.

2d. An absolute guarantee of the cost of the plant.

3d. Pumping machinery is not required.

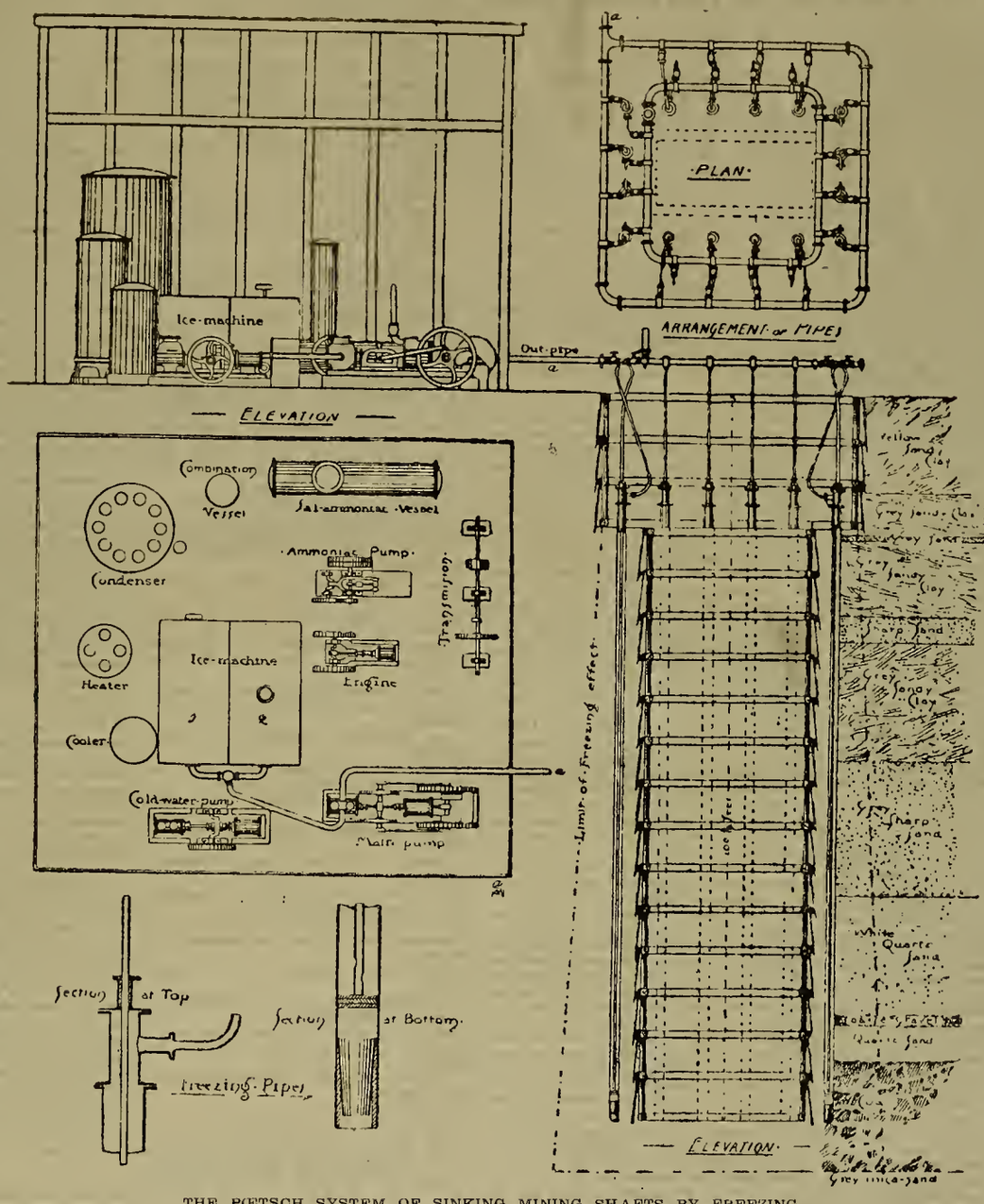
4th. It does away with any difficulty from meeting inclined strata of fluid material, since all the beds passed are converted into a single block of ice.

The engravings show the plant used, and its application at a shaft now being sunk for Dr. Warner Siemens, at the Centrum mine, near Berlin. The drawing from which we copy our illustration comes directly from Mr. Poetsch himself.

The fact that the simplest method of proceeding in any important work is the one last thought of, is strikingly illustrated in the very novel plan suggested and practised by this German engineer.

He has taken advantage of certain solutions whose freezing point is much below that of water, such as a solution of chloride of magnesium which requires a temperature of 40° below zero to convert it into a solid mass. The method of circulating this freezing liquid through the strata to be penetrated, is fully shown in the accompanying cut and the description.

The Poetsch method was first tried at the Archibald colliery, near Schweidlingen, Prussia. The second was at the Centrum mine, illustrated in the engraving. Where about 107 ft. of quick-sand, etc., has to be penetrated. This shaft had baffled engineers for years in their attempts to sink it; but in 33 days Mr. Poetsch had secured a 6 ft. wall of ice around the shaft area, with only 16 freezing tubes, and the shaft is now being excavated and curbed without difficulty. The third piece of work is at present under way at the Nimilia mine, Fensterwalde, where a 9 ft. shaft is being sunk through 120 ft. of quick-sand stratum.



THE POETSCH SYSTEM OF SINKING MINING SHAFTS BY FREEZING.

PLACER gold diggings have been discovered in the bed of the Satsop river, W. T., a few miles from its mouth.

Montana Mining.

An imaginary circle drawn hy a compass of colossal size, with one point resting upon the court house tower and the other describing the line of circumference at a distance of forty miles would include within its limits the richest mining region of the same dimensions in the known world. The Georgetown district, with its great iron mountain from which has been taken the millions of gold produced by the famous Castle mine; the less developed, though doubtles as rich, group of properties, including the Southern Cross, the Pyrenees and Amazon; the Silver Lake district with its great reef of rich silver-bearing ore; the Boulder district, and the metal lined spurs of the Rockies in Jefferson county, the Little Stony, and a thousand other mineral belts, would be within the boundaries of the alladinian circle. The mines of this mineral region are more or less extensively worked, and the section described already supports a large mining population which ie directly tributary to Butte, which furnishes the provisions, supplies, machinery, and, in most cases, the capital for the mining operations of the entire district. The work of hringing these outlying districts into rapid communication with Butte has been commenced hy the completion of the Utah & Northern branch railroad to Anaconda. It may not be long before the rich quartz veins of Silver Lake compel the extension of the Anaconda branch, fifteen miles, to that district and the Custom mills and ore purchasers of Butte may handle the high-grade sulphurets of Silver Reef. Other hranch roads will undoubtedly follow as rapidly as the development of the various districts will warrant, and in the most distant future we may expect to see a system of narrow gauge hranch roads winding their sinuous paths through the mountain gorges and conncting all of the tributary districts with their natural as well as financial and commercial center at Butte.

The True Standard of Value.

In estimating the value of a mining district the error is often committed of measuring the extent and value of mining operations hy the gigantic proportions of the enterprises prosecuted, or hy the amount of dividends paid. The dead and tenantless mill and smelter buildings and silent shaft houses of a hundred deserted mining camps will show the absurdity of making the amount of capital invested a criterion hy which to judge of the merits of any mining property, while a single illustration will exhibit the folly of relying upon the dividends paid as standard of value, viz: The total amount of dividends paid in the United States during the present year to July 1st was only $4,227,400, while the output of Butte mines alone was upwards of $3,000,000 during the same period. The true standard by which to gauge the value af any mining district is its actual

Output in Ore and Bullion,

And gauged hy this standard Butte City now makes a showing which places it in the lead of the great mining camps of the country. The *Miner* recently estimated the shipments of ore and matte from Butte for the current year at 108,000,000 pounds, the estimate being based upon actual shipments over the Utah & Northern railroad during the first half of the year. The statement elicited some criticism from certain journals which seemed averse to giving Butte credit for the gigantic proportions to which her mining operations had attained, but it now seems that the figures given were an under-estimate, and that the matte and ore shipments for the year will approach an aggregate of 150,000,000 pounds. According to the consignment of ore and matte made at the office of the Utah & Northern railroad during the present month up to the 26th inst., the volume of shipments has increased more than fifty per cent over the average monthly shipments of the six preceding months, the total shipments during July to date being 800 car loads, aggregating 16,000,000 pounds. Of these shipments about 12,000,000 pounds were of ore averaging 50 per cent and 4,000,000 pounds was matte.

The bullion shipments of the past week were 61 hars, valued at $94,812.—*Butte Miner.*

History of the Steel Square.

Pliny says that Theodorus, a Greek of Samos, invented the square and level, but the square figures are seen in the represented designs of the Tower of Babel, one of the earliest important known structures. The city of Babylon was a perfect square, and the bricks used in its buildings and walls were square; so probably were those in Babel. Now, to form small squares correctly, and to introduce them in endless combination into buildings, it needed a guiding instrument of some kind. So the square, as a constructive tool, came into use.

Among the ruins of Babylon, Nineveh and Petra, it is said to have been found represented. There are pictures and sculptures from the ruins of Thebes in Egypt, showing the square in the hands of the artisan.

Evidence of its use are also seen in ruins in India, which are thought by some to antedate those found in Egypt. Among the ruins of the Aztecs, or people before them, in Peru and Brazil, it has also been found; and though tools of stone and flint, such as axes, hatchets, hammers, etc., were the first used by primitive man in these ruins that date back beyond history, the square is found, and specimens may be seen in the British Museum.

The square was regarded by the ancients as a symbol of completeness. Simonides speaks of a man square as to his hands, feet, and his mind, etc. Aristotle uses a similar figure.—*California Architect.*

The Little Shops and Their Influence.

A late number of the *Scientific American* says: "It is time that notice should he taken of the work done as well as of the place taken hy our small shops. The 'big concerns' do not monopolize all the skill and mechanical capahility in the country. They may profess to do the best work and produce the hest results, because they are provided with the best tools. But they do not monopolize all the mechanical skill, nor colleot all the best workmen. Many of the best manipulators, and a very large portion of the most exact mechanics, are in the little shops; content, may he, to he the foremen, when in a big shop they would be only first-class workmen. The small shop men are valuable in any shop where mechanics, rather than operatives, are required, hecause they are generally 'men at a pinch,' 'expediency men,' and generally excellent workmen."

The proprietor ot a large manufacturing establishment, building fine tools of particular character, claims that his best men come from small shops where makeshifts and contrivances are the rule. "Such men," he says, "can make the shop hum hy their methods. It is very convenient to have a shop full of adapted tools, hut it is also convenient to have in the shop graduates from 'the little shops' who can contrive as well as tend a machine." There is much to be considered in the above. In looking over the numerous papers devoted to various industrial interests, as we receive them from day to day, we notice that by far the greatest number of contributors and those which are most practical and instructive come from the "little shops" in the small town and villages scattered through the country; and it is not at all surprising that such should be the case when the circumstances connected with it are fully considered.

Mechanics in the city are generally less inclined to be studious than those in the country. There are many more attractions in city life to take up the leisure moments. Workmen in large city shops are generally too much confined to specialties of work, and hence lack the opportunity to acquire that general shop practice and skill which necessarily comes to the workman in small shops. They are not so much given to thinking, contriving and inveuting. They have everything in the way of tools and conveniences readily at hand. The plan of confining a workman to certain narrow limits of practice is no doubt profitahle to the employer, hut it certainly does not tend to improve or enlarge the mechanical skill of the employee. Intelligent and enterprising workmen often rehel at such practice, and push out into the country, where such practice does not prevail. Then they more often hecome their own masters—"set up shop" for themselves; and it is from this class of persons, whether mechanics or manufacturers, that our varione technical journals derive their most valuable "shop notes"—little bits of valuable information, and often more elaborate communications which make up their weekly or monthly aggregate of information, which is eagerly sought for by every person who is desirous and ambitious to excel in his calling.

The present low condition of the industrial arts in China is almost entirely due to the system in universal practice there, of confining workmen to the narrowest possible specialties. There one workman will spend all his days in simply drawing circular lines on cupe and saucers; another will decorate with birds, and generally one variety; another is confined to drawing butterflies only, another dragons, etc. Such practice is also much more general in English shops than in those of our own country.

A man who would excel as a mechanic must master acquirements of a general character. He must not only acquire skill in the use of tools, both small and large and for various purposes, hut he must also attain a thorough knowledge ot the nature of the material upon which he works, and of the varions forms into which that material is wrought. He must also understand the philosophy of the construction and use of tools. Without these acquirements he will remain through all his life simply an imitation of the work of others. A thorough, practical education is the work of a lifetime.

Men are but hoye of a larger growth, and none of us ought ever to imbibe the idea that we are too old to learn. No mechanic ie so perfect but that he can learn something of his neighbor. We may study and practice from day to day, and for years, and still we can never reach the full measure of intellectnal good or of mechanical skill. There is no day in which we may not learn something which will he of advantage to us in the every-day duties of life,

San Francisco Manufactories.

In Assessor Holtz's annual report to the Supervisors he states that the expenses of his office last year amounted to $86,966.29, and appends the following schedule of the principal manufacturing industries of San Francisco:

Agricultural Implements—Men employed, 65; value of manufactures, $250,000.

Artificial Stone—Men, 80; value, $200,000.

Bag Manufactories—Men, women and hoys employed, 340; numher of hags, 9,000,000; value, $2,000,000.

Barrel Manufactories—Employed, 250 men and boys; value, $330,000.

Bedding Manufactories — Employed, 100; value, $350,000.

Boots and Shoes—Employed, 3,000; value, $5,000,000.

Cigar Boxes—Employed, 260; number of boxes made, 4,000,000; value, $400,000: paper boxes, employed, 100; number made, 2,250,000; value, $75,000: wooden boxes, employed, 340; number made, 14,500,000; value, $1,000,000.

Brass Foundries — Employed, 350; value, $535,000.

Breweries—Employed, 450; beer made, barrels, 415,700; value, $2,400,000.

Brooms—Employed, 60; value, $900,000.

Candle—Employed, 70; value, $355,000.

Chemical Works—Employed, 35; value, $350,000.

Cigar Manufactories—Employed, 7,478; cigars made, 102,900,000; cigarettes, 15,000,000; no value given.

Clothing—Employed, 1,900; value, $3,750,000.

Cordage and Rope—Employed, 150; value, $600,000.

Crackers—Employed, 195; value, $1,200,000.

Flour and Feed Mills—Employed, 190; flour made, 360,000 harrels; oatmeal, 2,200 tons; cornmeal and farina, 4,400 tons: barley, 16,000 tons and about 13,000 tons of split peas, cracked wheat, Graham flour, etc.; no value.

Foundries, Boiler and Iron Works — Employed, 2,400; value $6,000,000.

Furs—Employed, 170; value, $500,000.

Furniture—Employed, 1,350; lumber used, 7,000,000 feet; value manufactures, $2,328,000.

Gas Works—Employed, 460; capital stock, $12,000,000.

Glass Works—Employed, 180; value, $175,000.

Hats and Caps — Employed, 80; value, $275,000.

Harness—Employed, 440; value, $1,150,000.

Hose and Belting — Employed, 30; value, $150,000.

Jewelry—Employed, 175; value, $650,000.

Lead Pipe and Shot—Employed, 30; value, $200,000.

Lead Smelting — Employed, 116; value, $400,000.

Linseed Oil — Employed, 60; value of oil, $580,000; value of oil cake, $135,000.

Marble Works — Employed, 180; value, $290,000.

Match Factories — Employed, 120; value, $100,000.

Mirrors — Employed, 9; capital invested, $190,000.

Pickle and Preserved Fruits — Employed, 2,000; value, $1,600,000.

Provision Packing—Employed, 260; value of investment, $165,000; value of products, $2,000,000.

Rolling Mills—Employed, 540; value, $1,868,320.

Salt Works—Employed, 32; tons produced, 30,000; value, $250,000.

Sash, Door, Blind and Finishing Factories—Employed, 1,550; value of manufactures, $5,010,000.

Shipyards—Employed, 200; value of crafts built, $500,000.

Sbirt Manufactories—Employed, 2,550; value, $1,000,000.

Soap—Employed, 130; value, $715,000.

Sugar Refineries—Employed, 360; raw sugar used, 80,000,000 pounds; white sugar made, 50,000,000 pounds; yellow, 28,000,000 pounds; syrup made, 450,000 gallons; value, $8,700,000.

Tanneries — Employed, 335; value, $1,700,000.

Tinware—Employed, 180; value, $525,000.

White Lead—Employed, 75; value, $290,000.

Wooden, Willow Ware and Baskets—Employed, 32; value, $250,000.

Wine and Beer Casks—Employed, 100; value, $200,000.

Wire and Wire Rope—Employed, 50; value, $360,000.

Woolen Mills—Employed, 1,550: value of manufactures, $1,900,000.

NEW MANUFACTURING ENTERPRISES.—In Spite of the dullness of general husiness, says the *American Machinist*, the numher of new manufacturing enterprises projected or under way is by no means small. In the South several large cotton mills are being erected, as well as oil mills, lumber mills, and other manufactories. Western towns are devoting a great deal of attention to new manufacturing enterprises of various kinds, and considerable progress is now being made in that direction. Many towns and cities of importance have hecome quite active in offering inducements to new manufactories to locate witbin their borders. Notwitbstanding periodic seasons of dullness, and the agitation of the tariff question, the future of manufacturing in this country is one of great promise.

Smoke Abatement.

The abatement of the nuisance of smoke in cities, is a subject of late, receiving considerable attention abroad, though in this country no very energetic means have been adopted. In England they have a "National Smoke Abatement Institution." At a recent meeting of the Association some interesting facts were elicited. It was stated that gas engines, which are now used in numerous trades, have in the case of engines up to 20-horse power frequently proved themselves more economical than steam at the relative prices of gas and coal in London, as well as being completely free from smoke. It has been particularly pressed on the notice of the Council that steam-engines erected for the smaller class of workshops, etc., and placed, as they frequently are, at the back of buildings, cause a very great nuisance from smoke; and it is urged that, as gas-engines are more suitable for such trades, the erection of steam-boilers in back premises situated in crowded neighborhoods should be placed under some restriction. The number of gas-engines in London has increased very rapidly within the past three years, and the total number now at work is estimated at upwards of 6,000, and thus a considerable quantity of smoke has been prevented hy their use.

During the past year several new systems of American invention bave been tested, mostly based on Mallet's system, called "controll of combustion." It was shown that, if required, a chimney could he dispensed with, the needful draught being provided by an exhausting fan, without prejudice to the efficiency of the hoiler. Among the boilers tested may he mentioned one with flues curved or quadrantal form. It was found that this form was efficient, and superior for generating steam to the common type of vertical boilers. Another form of boiler, with flat flues and inclined grate, was found efficient as a steam generator, and the form of grate and other arrangements tended to greatly reduced smoke. An interesting series of tests of various mechanical stokers, all of which were in practical operation at one factory, were made, and it was proved that one of these stokers realized an economy of upwards of 12 per cent of fuel over the others, with an entire absence of smoke.

The Council consider the progress made during the past year has been eminently satisfactory and encouraging. They, however, deem it essential that legislation should be advanced *pari passu* with the voluntary efforts which are being put forth. As regards London, they consider it is necessary that the area now covered by the Smoke Abatement Acts should be extended, that all the tradee which do not at present come withiu the operatien of the Acts should be included; and, further, that the smoke of steamers on the river, which is now enormous and practically unchecked, should be brought under control, and the smoke from locomotive engines on the railways throughout the metropolis should also be restrained.

ANOTHER TRIUMPH FOR CALIFORNIA.—Some large stories were told not long ago about the Florida ostrich farm, which it was expected would soon bring feathers within the reach of every hired girl in the country. The feathers, as well as the eggs, however, were counted before they were hatched. The six hirds which were imported at a cost of $10,000, have all died hut one, and there never was an egg laid after they landed. The whole project is a dismal failure; the farm and stock have been disposed of, and the hired girl of the period in that region will sigh for the ostrich plumes in vain. Per contra, the success of this important industry now appears to be assured in California. The attempts made last year to batch the eggs failed, owing to the fact that the hirds were too young to produce fertile eggs, but this year a fine hatch of chickens has been turned out of the incuhator, and the young birds appear healthy and destined to live. One of the hens is hatching a brood after the natural fashion, but inventive genius has so far gotten to the windward of nature, that it is not probahle that setting hens will receive much encouragement. The importance of this industry ie very great, and its successful introduction will go far towards enriching our State and diversifying its industries. Another triumph for California.

THE PAPER MILLS of the world, about 4,000 in number, produce yearly 959,000 tons of paper made from all kinds of substances, including rags, straw and alfalfa. About one-half the quantity is printed upon; and of those 476,000 tons, about 300,000 tons are used by newspapers. The various governments consume in official business about 100,000 tons; schools, 90,000 tons; commerce, 120,000 tons; industry, 90,000 tons; and private correspondence another 90,000 tons. The paper trade employs 192,000 hands, including women and children.

THE Secretary's quarterly report, giving the operations of the Alice company at Butte, for the quarter ending July 1, 1884, shows the total receipts $329,101.70, and after paying dividend number 11, of $50,000 and all expenses, exhibits a balance on hand of $95,338.23 on July 1st.

ENGINEERING NOTES.

Ericsson's Solar Engine.

It is a notable circumstance that so eminently practical an engineer as Capt. Ericsson is recognized to be should never the less be so profound a believer in tho future importance of the solar engines as the motive power for great industries in many portions of the world. With inexhaustible supplies of coal at our command, and with a climate exceedingly variable, the subject possesses for us no practical interest and the same may be said of all the industries of Europe, which are situated principally in the northern portions of that continent; but for those portions of the earth that receive almost perpetual sunshine, the case is different, and Capt. Ericsson has advanced the opinion that the solar engine will be the motive power of the distant future, in which the seats of the industries will be transferred to those regions of the earth which are now at a great disadvantage because of the excessive supplies of solar heat which they receive. However visionary this view of the subject may appear, it is nevertheless highly interesting, and, considering the respectability of its source, worthy of attention.

Capt. Ericsson has constructed an engine which derives its power directly from the heat of the sun. It consists of two parts: the generator and the engine proper. Tho former consisting of a large concave reflector in the form of a cradle or trough, so arranged upon a central pivot that it shall constantly be exposed to the vertical rays of the sun. The solar rays falling upon this reflector, are consecrated upon a horizontal tubular heater placed above it. This water is supported upon side pillars, which are also hollow, and, like the heater contain water. The heater and its supports combined in fact form a steam boiler, since when highly heated by the sun's rays concentrated upon it, the water is converted into steam, by which the engine is operated. The latter may be of any convenient pattern, and does not require special description. The principal dimensions of this apparatus are as follows: Reflector, 11 feet long by 16 feet broad; heater, 6¼ inches in diameter by 11 feet long, exposing 130 × 98 = 1,274 square inches to the action of the reflected solar rays. In the arrangement of the reflector and steam generator, the solar engine of Ericsson differs substantially from that of Mouchot, of which a description has already appeared in our pages.—*Manufacturer and Builder.*

An Immense Canti-Lever Bridge.—One of the gratest pieces of engineering work in course of construction is the canti-lever bridge over the Forth in Scotland. Although from 900 to 1,200 men are employed in the work of preparing the steel, laying foundations for piers, etc., and the capital invested in the plant amounts to a half million of dollars, the contractors will consider themselves fortunate if they can complete the bridge within six years. Immense workshops for preparing the metal work have been erected on the ground, where the workmen also reside, and work is carried on night and day by the aid of electric lights. The cantilevers are so long that instead of attempting to carry them through the workshops where the parts are put together, the work shop itself is moved with all its ponderous machinery. Hydraulic presses are employed to make steel tubes out of plates over twelve feet in length, four feet in width, and an inch and an eighth in thickness. Ten of the plates bent to form and riveted together make up a steel tube twelve feet in diameter. Each canti-lever is to rise to a height of 350 feet above the immense stone piers, and will stretch out arms 650 feet in length, right and left of the center. The complete bridge will tower more than 350 feet above the water level.

Steamship Speed.—The Boston *Globe* is of the opinion that the limit of speed has been reached by ocean steamships, unless some great improvement shall be made in the application or conservation of power. The Oregon, on her recent remarkable trip across the Atlantic, in which she attained a speed of nearly 18 knots an hour, burned 337 tons of coal a day. The Aurania, which made 17 knots, burned 240 tons a day. The *Globe* thinks if it needed nearly 100 tons of coal extra a day to gain a little over one knot an hour, it would be safe to assume that it would have required quite 300 tons additional coal to have gained two extra knots an hour.

Skillful Engineering.—The frame structure of the Schuylkill Valley Railroad Company at Franklin avenue, in Philadelphia, was removed the other day and an iron bridge put in its place. All the work was performed in seventy-five minutes. The iron bridge was built upon a temporary trestling north of the frame structure and as soon as the old bridge was removed the new slid gracefully down greased tracks to the position which it now occupies. This feat in engineering was witnessed by a large gathering of persons. The structure is 80 feet long and weighs about twenty-five tons.

The Largest Engine.—The largest and most powerful engine in the world is that of the new Cunard steamer *Umbria*, which was launched from Cramp's shipyards, Liverpool, June 26th. It is a 12,500 horse-power.

USEFUL INFORMATION.

Dark Leather.

In the discussion of the various processes of leather making, it should be understood that every kind of leather will not take the black or dark color equally well. As far as proven by chemistry and close observation, we find that the materials found in the processes of oak-tanning are such as the dark colors take to kindly, while the elements found in leather tanned with pine or birch bark seem to repel any dark-coloring substances.

If, in attempting to color, the leather is found not to take color well, it should always receive some preparation, which will be found much cheaper in the end, besides the color being much more even and permanent. Some use a solution of the carbonate of soda for this purpose, but we would prefer a solution of caustic or ammonia, as they are much less injurious to the leather. The leather can then be washed off with clean water and the ground color laid on thinly with a brush and rubbed in until it is all taken up.

We find an excellent preparation for this purpose may be obtained by boiling campeachy wood for half an hour or so in half its weight of water, adding a sixth part of fustic to give a more intense black; pouring off the decoction, then boiling the wood in clean water for two hours. If a little potash be added to the second decoction, its extraction will be materially aided. The dye must be poured off clear, if filtered so much the better, and kept in carefully closed vessels. The black color is prepared by pyrolignite of iron, or may be by treating old iron with a decoction of barley, sour beer or sweet tan liquor. This should be left for a few days, the dirt removed from the surface, and the clear liquor drawn off. This black color must not be applied until the ground color is completely absorbed, else the leather will be sooty. After the black dye has been well rubbed in with a brush, it will have a finer appearance if another light coat of campeachy solution is applied, then rinsed with water until it runs off clear.

Spontaneous Combustion.—A curious incident which recently happened in the yard of the Merrimack Manufacturing Company is mentioned by the *Courier* of Lowell, Mass. An old log roller, used in a washing machine in the dye-house, had been condemned because it was worn from age. The iron rod running through the center of the log, by means of which the roller revolved upon its bearings, was surrounded by sulphur to prevent the wood from rotting quickly by the ready contact with water which the iron rod alone would allow, and also to make the parts of the roller hold firmly together. When the roller was condemned it was taken out into the yard and split open to separate the wood from the iron. The parts were not removed, but were left in the sun. Some chips among the refuse were discovered burning about an hour afterward. It created no little surprise at first that wood should take fire by simply being exposed to the sun. An explanation was subsequently arrived at. In splitting the log pieces of sulphur were also broken from the rod. A chemical action, made easy by the long and intimate connection of the sulphur with the iron rod (the latter had rusted considerably) had been partially completed, and needed only the burning rays of the sun to produce perfect combustion. The contact of the sulphur with the oxidizing iron formed sulphide or iron, afterward changing to sulphate, which is very sensitive to igniting agents.

A New Application of Oil for Stilling Rough Water.—The practice of pouring oil on troubled sea water has led a Scotchman to design a shell which can be fired from a mortar, and which on bursting spreads the oil it carries over the sea. The shell is fitted with two fuses, which are set alight by the explosion in the gun, and burn, although the shell is under water. On the bursting of the shell, the oil spreads over the surface, producing smooth water. The device was recently tried with success; the object being to still the sea between two ships in order to let a boat pass from one to the other. The shell fired from the ship carrying it (and every ship might carry a few) burst between the vessel, and calmed the waves with the oil.

Tinning a Soldering Iron.—Put a quarter of a pound of zinc into a bottle containing about half a pint of muriatic acid, let the mixture stand a few hours, and then pour off the liquid portion into another vessel. When about to use the soldering iron scrape the end clean with a file, next heat it not quite to a red heat, then remove the iron from the fire and holding it in the right hand dip the point into the liquid composition and immediately withdrawing it apply the solder by rubbing the solder stick against it, using of course the left hand for the purpose. If the solder has been rubbed on smoothly the iron will then be ready for use.

Oil for Preserving Beer.—A correspondent of the *Scientific American*, writing from Bengal, in India, says: In this country we continually have thunderstorms from March to October. For months together a night never passes without one more or less severe, generally the latter. I always keep beer on draught and find it never goes sour if it is hermetically sealed by having oil poured on the top. This should be poured into the barrel when tapped. On the other hand, without the oil the beer does not keep a week.

Chewing Gum. After kerosene, naptha, benzine, coal tar, and several other things are extracted from crude petroleum, the residue is known as paraffine, a clear white wax without taste or smell. The paraffine is cut up and melted, flavored with vanilla, peppermint, etc., cut into small pieces of various shapes, wrapped in oiled tissue paper, and put on the market as "chewing gum." It is estimated that over 200,000 cakes of chewing gum are sold every week in this country.

Consuming Smoke.—The following simple method for the consumption of smoke is given by a German exchange: Start the fire as usual and let it burn until the coals are in a bright glow; then rake the coals on the right and left, so as to form an empty space along the middle, and put the fresh coals into this space. The smoke which is formed from the fresh coal is consumed by the glowing fires on either side. If the grate is very wide, two such open spaces in the fire are advantageous for the addition of fresh coals.

Gold Coin.—About seven-eights of the gold coinage of the United States is in $20 pieces. This excludes gold coin from use as a currency in ordinary business transactions, and is useful only for export purposes. If Congress would authorize the issue of two, three and five-dollar coins—the gold containing sufficient alloy to make the pieces hard and of good size—they would form a very convenient and useful circulating medium.

The Electric Light Danger.—A few days since a defective connection in the wire of an electric lamp at Joliet, Ill., permitted it to come against the iron front of the building, and the whole iron work of the building became so electrified that whoever touched it received a severe shock. A bit of copper wire stuck in a hole of the iron columns became an electric lamp until the wire melted.

Linseed Oil a Preservative of Scale.—A pint of linseed (not linseed oil) used weekly, in connection with a thorough washing with hose, has been found to be one of the best substances to prevent scale in steam boilers. The linseed softens the scale so much that it comes away like sludge. Ground slippery elm bark also gives good results.

A paper chimney, 50 feet high, has been put up at Breslau. Compressed paper pulp is very hard to burn, and is recommended for fire-proof doors.

GOOD HEALTH.

How Nature Benumbs Pain.

Count Ranzau, the "Streit Hans"—"Rowdy Jack," as his comrades used to call him—once received three dagger stabs before he knew that he was wounded at all. Soldiers, storming a battery have often suddenly broken down from the effects of wounds which they had either not felt, or suspected only on a growing feeling of exhaustion. The Roman gladiators shouted and laughed aloud when their wounds were being dressed. A scalded child sobs and gasps for a therapeutical purpose; instinct teaches it the readiest way to benumb the feeling of pain.

The physiological rationale of all this is that rapid breathing is an anæsthetic. In a paper read before the Philadelphia Medical Society, Dr. W. A. Bonwill ascribes that effect to the influence of the surplus of oxygen which is thus forced upon the lungs just as by the inhalation of nitrous oxyde gas (which is composed of the same elements as common air, but with a larger proportion of oxygen) and mentions a large variety of cases in his own practice where rapid breathing produced all the essential effects of a chemical pain-obtunder, with appreciably diminishing the consciousness of the patient. Persons who object to the use of chloroform (perhaps from and instinctive dread that in their case the ether-slumber might prove a sleep that knows no waking), can benumb their nerves during the progress of a surgical operation by gasping as deeply and as rapidly as possible.

"One of the most marked proofs of its efficacy," says Dr. Bonwill, "was the case of a boy eleven years of age, for whom I had to extract the upper and lower first permanent molars on both sides. He breathed rapidly for nearly a minute, when I removed in about twenty seconds all four of the teeth. He declared there was no pain, and we needed no such assertion, for there was not the slightest indication that he was undergoing a severe operation."—*Popular Science.*

To Remove Foreign Bodies from the Eye. Before resorting to any metallic instrument for this purpose, Dr. C. D. Agnew (*American Practitioner*, May, 1884) would advise you to use an instrument made in the following manner: Take a splinter of soft wood, pine or cedar, and whittle it into the shape of a probe, making it about the length of an ordinary dressing probe. Then take a small, lose flock of cotton, and laying it upon your forefinger, place the pointed end of the stick in the center of it. Then turn the flock of cotton over the end of the stick, winding it round and round, so as to make it adhere firmly. If you will look at the end of such a probe with a two inch lens you will see that it is quite rough, the fibers of cotton making a file-like extremity, in the midst of which are little interstices. As the material is soft, it will do no harm to the cornea when brushed over its surface. When ready to remove the foreign body, have the patient rest his head against your chest, draw the upper lid up with the forefinger of your left hand, and press the lower lid down with the middle finger and then delicately sweep the surface in which the foreign body is embedded, with the end of the cotton probe. When the foreign body is lodged in the center of the cornea, it is most important not to break up the external elastic lamina; for if you do, opacity may follow, and the slightest opacity in the center of the cornea will cause a serious diminution in the sharpness of vision.

The Length of Lines of Type.—A prominent medical man of France has published an article in which he unequivocally condemns the lines of type in books and newspapers, arguing that their present length—being too long—is unfavorable to the eyes and nerves of the readers. He maintains that the eyes cannot, as of right they should, take in all the words of each line in the range of one focus. This doctor insists that the line of type ought not to extend much over two inches, that being the normal range of the eye when it is stationary. In regard to the shape and size of the letters, the same authority declares that the smaller the type the harder the strain on the eyes. An example is given in the miniature edition of Dante, shown in the last French exhibition, which ruined the eye-sight of three printers and two proof-readers. Concerning the shape of letters, the tall, thin Roman letters, technically known in France as poetic type, are the most trying on the eyes. Short heads and tails are to be preferred, because the eyes run more easily over them, and there is less liability of confusing one line with another. Like the German oculists, the French doctor maintains that the shortsightedness so prevalent in Germany is due entirely to the use of Gothic type. The Chinese style of writing and printing, in very narrow columns, would therefore seem to be the true system.

Purity of Sea Air.—It has generally been thought, and direct observation has confirmed the notion, that the air above the sea is singularly free from the low forms of organic life. MM. Moreau and Plantymansion have taken advantage of their leisure during a voyage in the Gironde from Rio de Janeiro to Bordeaux to obtain some data bearing on this question. They have found that over the open sea, at a distance from the vessel, the air contained very little solid matter. The land breezes appear to become rapidly free from the multitude of organisms which they carry with them from populous districts. M. Miquel, of the Montsouris Observatory, regards the fall of germs into the sea as a reassuring fact; breezes blowing from the distant continents, which might otherwise bring epidemics with them, become purified, it is supposed, in crossing the ocean. The gentlemen above named have found that the atmosphere immediately about the vessel practically swarmed with micro organisms; the vessel seemed to be surrounded by an "atmosphere of microbes."

M. Pasteur's Hydrophobia Experiments.—The experiments which M. Pasteur is reported thus far to have made are said to be an unbroken success. Fifty-seven dogs have been the subject of investigation. Of these nineteen were rabid, and by these thirty-eight healthy animals were bitten under uniform conditions. Of the thirty-eight, one-half the number has been previously inoculated or "vaccinated" with attenuated virus; the other half had not. The latter, without a single exception, died with unequivocal signs of rabies, whereas the nineteen others remained as well as ever. They will be watched for a year by veterinary surgeons to see whether the inoculation holds good permanently or only temporarily. If rabies be not spontaneous in its origin, and if the experiments of Pasteur all turn out successful, there seems no reason why canine madness should not be extirpated from our midst.—*Lancet.*

Sickness and Labor.—Sir James Paget estimates that in England the whole population between fifteen and sixty-five years old do in each year 20,000,000 weeks' work less than they might do if it were not for sickness. Typhoid fever has of late destroyed in England and Wales, among persons in the work time of life, nearly four thousand in a year. Here, therefore, from one disease alone, and that preventable, results an annual loss of 230,000 weeks' work, without reckoning what is lost with those who die.

Smoking and Blindness. An English newspaper calls attention to the fact that there are very few smokers among the blind. Soldiers and sailors who are suddenly deprived of their sight sometimes continue to smoke for a while, but it is said that most of them soon give up the habit. They say it gives them no pleasure when they cannot see the smoke, and some even declare that they cannot taste the smoke unless they see it.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

BULLION SHIPMENTS.—Amador *Ledger*, August 16: On Monday of last week the bullion shipment from Amador City amounted to over $47,500. This gold production came from the several mines as near as we can learn as follows: Keystone, $32,000; Bunker Hill, $12,000; South Spring Hill, $3,500.

MISCELLANEOUS.—Work was resumed on the Median mine at Amador City, on Monday morning. Three men were put to work. The Median lies east of the Keystone and South Spring Hill, and bids fair to prove a paying mine. The sulphuret works at Drytown were started up last week with every prospect of a long run. They are now working on sulphurets from Grizzly Flat, El Dorado county. There are five chlorination works in active operation in the county at the present time. The Middle Bar tunnel is now in nearly 1,400 ft. The upper tunnel is almost at a stand-still, only one man being employed there. Work on the tunnel at Hunt's gulch in upraising to make connection with the shaft in Murphy's gulch is progressing satisfactorily. Over 100 ft, or about half the distance, has been accomplished. Some one tore up the pipe that carries water to the Mahoney to run the pumps early this week. Five lengths were taken apart, and pumping operations were brought to a standstill for a few days.

Calaveras.

SOLD.—Calaveras *Chronicle*, Aug. 16: Rumor says that the Hanby mine near Donallon's bridge has been sold for $10,000. The mine is in the ranch of P. Masterson of San Andreas, and in order to get the mine they were obliged to buy the ranch also, for which they paid $2,700. Al. Currier and Joe Reed has gone to work on the Zumwalt gravel claim on the Calaveras. The parties go in as partners with J. H. Zumwalt, the original owner.

BLUE MOUNTAIN.—Cor. San Andreas *Citizen*, Aug. 14: J. Swank, C. L. Butterfield and Byron Swank left Sheep Ranch on Tuesday morning last to commence operation upon their silver lode in the vicinity of Blue mountain. The excitement here relative to this remarkable discovery continues unabated. Sample ore brought down from the lode was tested by Horatio Smith, amalgamator and assayer for the Sheepe Ranch Mining Company, and was found to reach the enormous rich figures of $659.77 per ton silver, with traces of gold—about $4 per ton. Upon inquiry the proprietors of the claim assert that the ore which was assayed was not a specimen but an ordinary sample of the vein rock. Great developments may soon be made upon this remarkable claim and fortunes may be grasped by its respective owners in a very short time. Wealth may spring up in the neighborhood of the majestic old Blue Mountain and a mining boom instituted that will stand unparalled in the history of Calaveras and its gold mines. We hope that it may so prove.

Inyo.

DEFIANCE FURNACE.—Inyo *Independent*, August 16: A run of eight days was completed at the Defiance furnace at the end of last week. The result netted forty tons of bullion, worth $12,000. The mine in connection with the furnace has already produced in bullion $1,150,000. For the first few years the mine did not pay expenses; labor and all kinds of supplies were excessively high, and the process of extracting the metal from the ore was imperfectly understood. Experience remedied the last named difficulty, but still the owners got small profit; getting the bullion to San Francisco alone cost $45 per ton. Since the building of the Carson & Colorado railroad the cost is but $24 per ton. This railroad is of great value to the mining interests of the county. Last winter an immense body of ore was found in the mine. It is rich in silver, but does not contain lead enough to smelt. For some time past work has been pushed to reach another body of ore that is known to contain sixty per cent. of lead; it also contains about sixty ounces of silver per ton. Mixed with the higher grade ore, this will make a good working combination. The main ledge in the mine is sixty feet wide, and has been opened 500 feet on its length, and 300 feet deep. When the ore body, toward which work is now pushed, is reached, the furnace can be kept constantly at work the year round. The cost of reducing the ores is $10 per ton. On the dump at the mine is not less than 30,000 tons of ore, the assay value of which is $8 per ton. The Superintendent of the works—Mr. J. S. Gorman—has gone to San Francisco in search of some method of concentrating this ore by dry process. If such can be found the proprietors of the mine will profit largely, and an immense stimulus will be given to the mining industry of the county, as at many other mines there are large quantities of the same material.

BULLION.—A shipment of bullion was made from Keeler August 8th, that weighed 20,000 pounds. The bullion was for the Selby Smelting Works, Oakland, and was worth $300 per ton.

Mono.

STANDARD CON.—Bodie *Free Press*, August 18: They extracted and shipped to the mill 534 tons of ore and 665 tons of tailings; they received from the ore 710 ounces of crude bullion, and from the tailings 480 ounces, and had have shipped to the company this day $13,648.76, of which $9,010.03 is from 2 week's run on ore, and $4,638.72 from 2 week's run on tailings.

BODIE CON.—At the mill 198 tons of tailings were worked, the average assay value being $8.50 per ton. At the mine the north drift, 200 level, Fortuna vein, is in 47 feet.

BULWER CON.—The south drift from west crosscut No. 2, 500 level, has been advanced during the week 13 feet, and is now in 385 feet.

Nevada.

AN OLD LEDGE, BUT A GOOD ONE.—Nevada *Transcript*, Aug. 16: In early times one of our citizens worked for day's wages on a quartz claim a half a mile from town. Owing to the interest now being taken in quartz hereabout, a few weeks ago he concluded to do a little prospecting in the old mine, it having been abandoned for 25 years. He sunk a shaft on the ground and after having got down a few feet he struck a rather small stringer, took out three tons of rock, and had it crushed. It yielded just $80 per ton. He is now pushing the work ahead and expects to take out 20 tons for the next crushing. The ledge is very small, but almost every piece of rock shows free gold. This is only one of the many ledges in this vicinity which would pay handsomely if the right kind of work was done on them. We reiterate the statement that there is not a better field in the world for quartz prospectors than Nevada City district. There are undoubtedly hundreds of unknown and unclaimed ledges hereabouts that will some day or other prove equal to any now being worked.

WORK AT THE NORTH STAR.—Foothill *Tidings*, August 18: We took a trip on Tuesday to the old Scotia mine, where Mr. May, the contractor, with his corps of assistants are busily engaged in tearing down and removing the building and machinery. Rapid progress is being made in this work, and already considerable of the machinery and most of the heavy timbers of the Scotia have been placed on the grounds at the North Star, and it will be but a very short time before the entire outfit shall have been moved. Down at the North Star ground, work is going rapidly on in the drain tunnel and in the incline. Mr. Stoddart, the superintendent of the mine, informs us that the drain tunnel and the incline shaft are in much better condition than he expected to find them, and that the cost of cleaning out and putting them in order will be less than one-half of the expense that it was estimated at. The work on top at the North Star is going on in fine style, and everything is being made ready for the reception of the Scotia works. Several companies of tributers are at work on a portion of the ground and they have good indications. In a short time business will be very lively around the North Star mine, and in about six weeks there will be about 80 men employed around the premises. The mining outlook for the district south of Grass Valley is indeed flattering.

CANADA HILL DISTRICT.—Nevada *Herald*: The outlook for quartz mining in the above district is very flattering. Marsh & Hothersoll, after doing considerable dead work in their mine, have been rewarded by striking a splendid ledge of rock. The ore looks well, and it is expected will yield handsomely. John Coe, who owns an extension to this ledge, feels so encouraged over the prospects that he has commenced work on his claim. If the strike made holds out, Coe will be very apt to find a good ledge on his ground. The Charonnat mine holds its own, and the mill is running on first-class rock. It continues to be one of the best-paying properties in the county. Ed Moore is working his mine at Canada Hill, and the prospects are improving daily. By miners who have examined it, the location is regarded as a valuable one, but very little systematic work has been done towards opening up the mine.

MARYLAND MINE.—Grass Valley *Union*, August 16: Preparations are nearly perfected for starting up work on the Maryland mine. Connections have been made to run the hoisting and pumping works, the water supply being obtained from the line of the large pipe that supplies the Idaho works. A six-foot Pelton water-wheel is now ready to be put in to drive the machinery, and this wheel will be in place to-morrow. Everything will be in readiness to start up work next week, when the sinking of the main shaft, which is 125 ft in depth, will be resumed, and the work thereafter diligently prosecuted. As is well known, the Maryland is the first extension east on the famous Idaho lode, and as the pay chute is dipping regularly in that direction, it can confidently be counted upon being struck in the Maryland when the proper depth is reached. There is much of promise in the future of the Maryland mine, and it is a location that has been long held in high favor by the mining men of the district.

Plumas.

FOREST KING.—Greenville *Bulletin*, August 13: In company with D. McIntyre, we visited the Forest King mine yesterday. We found everybody busy. The tunnel is now in 225 ft. They have drifted in the vein of pay ore 65 ft. The breast of the vein is now strong. The width of that which pays is about 6 ft, and the rock is now being sent to the mill. It is the intention of the owners to push the drift ahead as fast as possible, and for that purpose they will put on a night shift in addition to the present force. The vein improves as they go ahead. The mill is running nicely and the plates are looking well. It is believed, from the developments that have already been made, that this mine will become one of the most important in this section.

Sierra.

SIERRA BUTTES MINE.—Sierra *Tribune*, Aug. 14: No. 9 tunnel at the Sierra Buttes mine is now in 4,400 ft, with an average of 35 ft being run ahead each week. The pay chute of ore will be encountered in this tunnel about 1,000 ft further ahead. The 40 stamps in the lower mill are running regularly. Work is now progressing on the foundation for another 20 stamps to be placed in operation this fall.

ONE THOUSAND AND ONE GRAVEL MINE.—The above is the most prominent gravel mine in this section. It is located 4½ miles east of town. Eleven men are employed there under the superintendency of Thos. Williams. The character of the gravel is such that all of the gold cannot be saved in the first washing. From the dump the gravel is washed through about 100 ft of flume and then dropped 15 feet on hard bedrock, where it is held by a dam, allowed to slack and then washed a second time. The company propose having a series of these falls and dams and in that way hope to realize all the gold there is in the gravel. As work on the channel progresses the gravel is getting richer and softer. The gold is coarse and heavy. There is a 5 mile ditch connected with the mine which carries an abundant supply of water the greater portion of the year.

KENTUCKY QUARTZ MINE.—Parties are now negotiating for the purchase of the Kentucky quartz claim. A tunnel is being run on the ledge which is already in 200 ft. This tunnel taps the ledge 150 ft below surface. The vein averages about 2½ ft in width and prospects spendidly. The ditch leading from the river to the mine is nearly completed.

THE YOUNG AMERICA.—At the Young America quartz mine a shaft has been sunk 60 ft. The shaft will be put down 75 ft and then a tunnel run to strike about 60 ft still below this. The two will then be connected by raising from the tunnel. The owners propose to develop this mine in as thorough and rapid a manner as possible. At the present workings the vein is 3 ft wide and prospects as rich as ever. Nine men are employed at present.

ACTIVE WORK.—At the Marguerite mine the work of completing the new shaft and prepairingfor the placing of the machinery is going actively ahead. G. Humbert has arrived from below and will superintend the work of placing the new machinery in position. It is expected to have the new plant in running order in 60 days.

CONCLUSION. — The outlook for a prosperous mining era in this section is daily growing brighter. The edges around here are rich and extensive with every possible advantage for operating them on an economical scale. There are many claims owned by parties who do not possess sufficient means to develop them. For that reason many fine opportunities are offered to people who have money to invest in mining properties. [illegible]

RICH GRAVEL.—*Mountain Messenger*, August 16: At the 1,001, claim, last week, $14 was realized from a pan of gravel. The gold is becoming coarser and more plentiful. A small quartz mill is needed to crush the hard cemented gravel, that will probably be put up in time. This is one of the most promising locations in the county.

HOG CANYON.—P. A. Lamping's 12-stamp mill, run by steam power, began Wednesday morning to crush quartz from Maxson's ledge. Supt. Vanslyke is slowly but surely developing one of the most valuable mining properties in Sierra. Supt. J. D. Fagg has six men employed putting in a track from De Long ledge to Lamping's mill, and will soon be rolling out the quartz.

BALD MT. EXTENSION.—The Extension Company expect to raise a chute from the end of the main tunnel, next week. The character of the bedrock indicates gravel above.

Siskiyou.

ORO FINO.—Cor. Yreka *Union*, August 14: I learn from my neighbors who visited Campbell & Co.'s claim, that the owners took out upwards of $50,000. The ground worked this season paid 40 cents to the square foot, or $10.80 to the square yard, or $4438.40 to the square rod. This, with a bank of from 40 to 60 ft, I call first-class diggings. This mine is now considered to be one of the best in this county. Just think of it: the gold dust, after being cleaned and reiorted, weighed upwards of 250 pounds. I have not got the number of days they run, or the cost of the season's work.

HAWKINSVILLE.—Higgins & Spreckles, between here and Yreka, have cleaned up their ground sluice, which gave them a good dividend; in fact, it paid better than they expected. There is at present five companies engaged in ground-sluicing in this vicinity, all of whom are getting good prospects. Two other companies will start up soon. Mr. Bob Lodge, of Yreka, and others have taken up a quartz ledge at the head of Long gulch, about two miles west of here, and have gone to work in earnest taking out quartz, which prospects very well. We may soon see a mill running.

Tuolumne.

THE BONANZA.—Tuolumne *Independent*, August 16: Work on the Bonanza mine will commence soon. We see by the deeds on record that A. B. White and our old friend J. B. Bacon, of San Francisco, have made arrangements for the right of way for a tunnel from Holden's garden into the mine, some 300 ft in depth on the incline. The distance to run to get under the old works will be 390 ft, which includes 60 ft of open cut. They are constructing this tunnel for a certain interest in the mine. The parties have money put up to continue the work of development two or three years, whether they strike it or not. When work was stopped some time ago, very rich rock was in sight. Those who know, say they will have a big thing when the tunnel is completed. Operations are expected to commence next week, under the management of W. R. Ready.

BONANZA MINE.—*Union Democrat*, August 16: Having obtained the right of way through B. A. Smith's lot and privilege from the city to run under the street, J. B. Bacon and A. B. White made a contract Wednesday for the running of a tunnel upwards of 300 feet in length into the Bonanza mine. Upon certain terms and conditions, they will become part owners of the mine with J. G. Divoll, present owner. The contract for running the tunnel was taken by W. R. Ready, and John P. Dart will superintend the work. Driving the tunnel, it is expected, will commence Monday. It is believed that large amounts of gold lie concealed in the mine, and by means of the tunnel it is hoped its treasures will be brought forth.

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, Aug. 16: The west crosscut on the 2800 level was yesterday cut over 50 ft. The face is in solid quartz of excellent appearance, but carrying no metal. The porphyry encountered two or three days ago, which was thought to indicate a near approach to the west well, proved to be merely a small horse. The crosscut will be pushed ahead until it cuts the west clay. This will give the coarse of the ore vein. The ground continues dry. The usual shipment of between 400 and 500 tons of ore will be made this week from the 200 level.

SIERRA NEVADA.—The joint Ophir, Union Con. and Mexican winze, below the 3200 level has been sunk and timbered 8 ft. No permanent change of materal since last report. Repairs are being made to the joint shaft. The broken fly-wheel connecting rod has been repaired, is now in place, and the pumps are running all right. On the 3100 level west crossent No. 3 has passed through the streak of low-grade ore, which is found to be about 10 ft in width, strong and well defined.

OPHIR.—On the 250 level are taking out fillings. On the 500 level the west drift has been extended 55 ft. The joint Sierra Nevada, Mexican and Union Con. winze below the 3200 level has been sunk and timbered 8 ft. No permanent change of material since last report. The fly-wheel connecting rod at the Union shaft has been repaired, is in place, and the pumps are again going all right.

ALTA.—The west drift on the 2150 level is being advance at the rate of over 70 ft a week. It is in material of a very favorable appearance, which carries some low-grade ore. The flow of water from the drill hole in the east drift on the 2150 level is slacking off a good deal. The diamond drill will be put in again to-day and the hole extended.

UNION CON.—On the 3200 level the joint Mexican Ophir and Sierra Nevada winze has been sunk and timbered 8 ft. No permanent change of material since last report.

MEXICAN.—The joint Ophir, Sierra Nevada and Union Con. winze below the 3200 level has been sunk and timbered 8 ft. No permanent change of material since last report.

GOULD AND CURRY.—The joint Best and Belcher west drift on the 2500 level is now being advanced at the rate of about 45 ft per week. The drift is in soft porphyry, with seams of clay and occassional streaks of clay. The north drift from the 825 station of the Bonner shaft is making about 60 ft a week in material of a favorable character.

CHOLLAR.—The main west crosscut on the 2800 level was yesterday out 114 ft. The face was in solid quartz of a good appearance, and carrying a small amount of metal. The ground is perfectly dry.

ALPHA.—The north drift is being advanced in quartz of a promising character, which yields low assays. The east crossent has passed into porphyry. There is hope of finding paying ore to the northward as there is a large amount of quartz in that direction that is of a fine quality and texture.

YELLOW JACKET.—Above the usual quantity and quality of ore is being extracted on the old upper levels, and the mills on the Carson river are kept running to their full capacity. The usual exploring work is successfully continued.

CON. VIRGINIA.—The diamond drill is still being run on the 2900 level. This mine and the California will probably be consolidated. The work in the two mines is so intimatey connected that it cannot very well be segregated.

BENTON.—A branch drift from the main west crosscut on the 2150 level of the Alta is being run into the Benton ground, and is in quartz carrying some low grade ore.

UTAH.—On the 1950 level the south drift is making good progress in a softer and a more favorable material showing streaks of quartz alternating with seams of clay.

CROWN POINT.—A good deal of low-grade ore is still being found on the old upper levels, and the mills on the Carson river are kept running to their full capacity.

ANDES.—About the usual amount of low-grade ore is being extracted, and the prospecting drifts are showing quartz of a promising character.

Central District.

GOOD PROSPECTS DEVELOPED.—*Silver State*, August 13: S. W. Hammand, of Central, is in town, and reports that camp in a flourishing condition. The railroad mine, owned by Clark Brothers and Norman Gilbert, is producing rich ore. One-half the mine—1,500 feet—is owned by Gilbert. This is developed by several inclines and tunnels. The lead is over 30 feet wide, the ore is low grade, but there are immense quantities of it in sight in the mine, besides several hundred tons on the dump. The Clark Brothers' claim that this mine produces ore which works on an average $60 per ton. A lot of several tons of assorted ore recently shipped from the mine to San Francisco netted $260 per ton. The five-stamp mill built on the Humboldt river and run by water power, to work this ore, was started up a few days ago, and it works like a charm. Charley Clark and Ed. Shermer are working on the Mogul mine, and taking out very rich ore. The Mollie, a mine discovered last winter by S. W. Hammand, is proving to be very valuable. It was a blind lead, and was accidentally discovered. The ore assays from $100 to $400 per ton, and there is a streak of it near the surface from five to ten inches thick. M. S. Thompson has resumed operation on the Marietta, which is prospected by an incline to a depth of 325 feet, and it shows ore from top to bottom. The new mill at Mill City has been started up to try the machinery. It works well, and when some slight changes are made in the furnace, it will be run steadily.

Cherry Creek District

TICUP.—Cherry Creek *News*, Aug. 9: A new strike of much promise has been made in the Ticup—right on the surface. The ledge is said to be extensive, and so far as prospected shows well.

Esmeralda District

AURORA'S MINES.—Walker Lake *Bulletin*, Aug. 16: The Humboldt mine is now working 20 men, running drifts and sinking. Ore is being taken out as the development progresses. On the Silver Lining 14 men are at work, running drifts north and south from the shaft. They take out about 10 tons a day. As soon as machinery can be procured stoping will be begun. These mines now, although only in a state of development, supply enough ore to keep the mill running nearly all the time, and there is not a question that when capital can be secured to open them extensively, or when the slow method of development on their own proceeds is completed, they will rank among the richest mines in the State.

Mount Cory District.

THE MOUNT CORY MILL.—Walker Lake *Bulletin*, August 14: The machinery of the Mount Cory mill was stopped Monday, to allow for putting in place two temporary rolls which arrived that afternoon. The new steel tires are on their way from New York, but it was thought better to have temporary tires made in Carson, lest some delay in transportation might necessitate a longer stoppage. The mill will resume this evening. This, the largest mill in the State, furnishes less facts for comment than any other. Its work is the same from day to day, and no accidents mar the regularity of operations. The ore body in the mine is now larger and of better quality than at any other time, and everybody in this section is glad that the enterprising managers are meeting with the success which their liberal preliminary outlay deserves.

Osceola District.

A FAILURE.—Cor. Pioche *Record*, Aug. 12: Some fews weeks ago I wrote you as to the placer mining of Osceola, in this I will treat of the quartz claims at present being worked in this district. The Osceola Company, an eastern incorporation, that some 12 months since bought of George Monroe and others a mine known as the Linton & Monroe claim, the consideration being $60,000, have after a month's trial of said mine, "thrown up the sponge," the speculation being an unprofitable one. Shortly after

purchasing this property the company erected a 20-stamp mill, put hoisting-works on the mine, built roads, boarding and sleeping dwellings for the men, and otherwise expending cash to the amount of $60,000 more, making in all $120,000. In conversation with Supt. J. C. Turner a few days ago, he said that if the ore went $5 per ton he could have made it pay; as it was, it went $3.50, and sooner than run the company any further in debt, he preferred to abandon the enterprise. Mr. Turner further stated that as soon as he had cleaned up, the machinery was to be taken apart and reshipped to the makers in Chicago. The abandonment of this property by the Osceola Company is certain to retard the development of other quartz claims, of which there are quite a number. The next claim of importance is the "Virdi," owned by Capt. Akie. The captain has at present four men employed on the mine and is extracting a very fine character of ore, that is said assay $100 a ton. Some 100 tons of this ore is at present awaiting reduction at the Osceola Company's mill. The next mine of prominence is owned by Boone Tilford. This young man has some 60 tons of high grade ore that is to be worked at the Osceola mill, and if report is true as to late developments in the mine, Mr. Tilford has a bonanza. There are several other promising quartz claims in this section, that are being prospected more or less, and when the large amount of coarse gold that has been taken out of the placer mines is taken into consideration, said amount being only a drop in the bucket to what is still remaining in the deposits, it is safe to infer that some rich and extensive quartz claims will be found at no distant day in this rich but only partially prospected camp.

Patterson District.

RICH ORE.—*Pioche Record*, Aug. 12: We have had grave doubts as to the truthfulness of the reports in regard to the rich ore that has been uncovered in old Patterson district, in the northern part of the county, but such really appears to be the case. The mine owned by Matthewson & Flower is yielding some fabulously rich ore. Nine tons were shipped over to Frisco, Utah, during the week, and there are 10 tons more awaiting shipment. They have a lot of 4 tons, assorted from 18 tons, that they expect will work $1,300 and upwards. The Gray Eagle mine owned by Doc Clay, is reported to contain exceedingly rich ore. If one-half of what we hear in regard to Patterson is correct, there will be a considerable stir and the old abandoned district will be reinhabited.

Spring Valley District

THE EAGLE MINE.—*Silver State*, August 18: H. B. Purdy, a practical mining man of twenty years' experience, has leased the Eagle mine and mill in Spring Valley, and has resumed operations on the property. It will take some weeks to repair the mill and get the mine in good shape for working, after which he will start the mill—a fifteen-stamp one—crushing ore, of which there are large quantities of second-class quality on the dump, and no doubt large bodies of first-class in the mine.

Taylor District.

LEACHING.—White Pine *Reflex*, Aug. 12: A leaching mill is soon to be erected at Hamilton by Messrs. Kendall & Robinson, so we are informed by Mr. Salm who left Taylor a few days ago to assist in its erection. The Argus Mining Co. purchased Henry Hilp's fourth interest in the Neptune mine Wednesday, paying therefore $1,500. Men were put to work on the claim within 12 hours after the purchase. Ten men were put to work on the Neptune, one of the Argus Mining Co.'s claims, Thursday. The surface indications of the Neptune are good. If there is anything in indications this claim will develop into as good a piece of mining property as there is in the camp. It is the intention of the company to push work on the claim from this on.

Tuscarora District.

GRAND PRIZE.—*Times-Review*, Aug. 16: South drift on the 400-ft level has been advanced 22 ft during the week. An upraise has been started to connect with the 300 for ventilation. Progress during the week in the 300 south drift, 21 ft. Stopes producing as usual. Mill is running all right and doing good work.

BELLE ISLE.—Joint Belle Isle and Navajo line upraise 25-ft level, has been carried up a total distance of 55 ft. The vein at this point shows 6 inches of $1,000 ore. The line crosscut 150-ft level, has been extended 50 ft; in this distance the vein has been cut and shows the usual width of high-grade chloride ore. The prospects are very encournging.

INDEPENDENCE. — Total length of west drifts, 400-ft level, 78 ft; progress, 9 ft. The vein shows a fair width and the grade of ore begins to show an improvement. Some very rich ore was taken from the foot-wall the past week. North crosscut, same levels, has been extended 8 ft. Will resume work in No. 2 upraise, 300-ft level, now up 50 ft. Stopes on this level are producing some good ore.

NAVAJO.—Eleven feet have been added to the length of the south drift, 200-ft level. Joint line upraise has been carried up 5 ft and shows a decided improvement. Line crosscut, 150-ft level, has been extended to the east vein, and at this point the vein carries the usual width and grade of ore. North drift from No. 2 crosscut shows an improvement, and has been extended 110 ft. The mine is looking very fair at all points.

White Pine District.

HOPEFUL. — Cor. Eureka *Sentinel*, Aug. 16: Manager E. N. Robinson, accompanied by the Secretary of the Sweetwater Co., Mr. Foster, has arrived, rumor has it, with plenty of coin for mining. The Stafford mine in which the late strike occurred is a good property and has been regarded as such ever since 1869. About that time Hearst, Thornburg and others spent $40,000 on the property. They developed it to the depth of only 80 ft and showed up a considerable body of low-grade ($30) ore, but that sort of stuff could not be made to pay at that time. Since then the Stafford has yielded off and on altogether about $130,000 with comparatively little work done. There is no doubt that the recent find promises well. It occurs in the south end of the mine, shows big, and the ore is rich and runs all the way from $100 to $350 per ton. Mr. Robinson has put eight miner to work to develop it. He has, also, two men working on contract in the Wheeler tunnel. The Jennie A Company, are running a tunnel for its own and the Black Rock prospects, and they are in 700 ft with a promising formation for ore. I am told that as soon as they strike ore in the tunnel, they intend to start up the King furnaces. Several years ago this company bought the Ward Beecher mine and mill and water, also, about 28,000 tons of tailings, with an average assay of from $10 to $12 per ton. It is rumored that Manager Kendall of the Jennie A thinks it likely that his company will start to reduce these tailings. The Continental Co., of San Francisco, are taking out some very fine base ore and will try shipping it to Eureka for reduction, and if the test proves satisfactory they will continue to ship; but extracting, sacking and freighting over 40 miles, on an allowance of 07 per cent, requires mighty big pay ore. The Eberhardt & Aurora Co. are boring away on their tunnel level, which is now about 1,400 ft under Treasure Hill. Everybody hopes they will be successful and come into bonanza yet. But why might it not pay the company to nose around nearer the surface? At a depth exceeding 300 ft they took some $9,000,000. I am not alone in thinking that there is more ore where that came from. This company has run through 10,000 ft of ground—1,700 ft of incline, 6,400 ft of tunnel and some 1,000 ft of drifts. The Eberhardt truly deserves praise, for they have done more than all other companies combined in this county. Started in 1871, they built a 60-stamp mill at a cost of $300,000, which was destroyed by fire. They next built a tramway at about the same expense. They may congratulate themselves on this, at least, that they have more work to show for less money than any company in Nevada. They have always paid their miners $4 a day, and I am sure they are worth their hire—good, practical miners that work under ground more than a mile and a half deep in bad air and liable to accident at any time.

ARIZONA.

BLACK CANYON.—Prescott *Courier*, Aug. 11: W. C. Dawes is in receipt of a letter from Messrs. McPhee and Rice, who are prospecting the American Tramp mine, in Black Canyon district. The mine is opened by shaft, 120 ft, ledge 7 ft thick, with 4 ft of ore. They are now drifting, are moderate in their ideas, but believe they have something for a rainy day. Messrs. Bond & Hayden have leased the Bradshaw Basin mill and roaster and will now work 300 or 400 tons of their best ore. They may also do custom work. They have a fine mine. B. T. Riggs and John Curtin have leased the discovery location on the Tiger lode and will soon start work on the same. Mr. Riggs knows the Tiger "like a book" and will surely take out some rich silver ore. John Holmes, whom we may call the Tyler of Turkey Creek district, was in Prescott yesterday, arranging for shipping some of his ore. The Dosoris company will very soon divide about $75,000 between its owners. Messrs. Cox and Craigue have gone east. One of our mercantile firms, take in about $1,000 a month in placer gold.

LESSEES. — Prescott *Courier*, Aug. 16: B. T. Riggs, who recently visited the Del Pasco, tells us that the lessees of the mill do their own work and are making money. They are mining in the Pine Tree lode. This is "clean-up" day at the Kimball mill. Messrs. Bagley and Marlow are developing a promising mica mine 2½ miles from Williamson valley. The vein is large and so are the leaves of mica. Messrs. Burton and Murphy have leased one of Major Dake's Walker District mines. They expect to take out silver worth $300 per ton. Some 20 miners are at work in the Lane mine, the ore of which is being worked at the Tuscumbia mill. The St. Louis Yavapai Co., of Humbug district, think their mill will be running in about 30 days.

A GOOD WORD FOR DOS CABEZAS.—*Epitaph*, August 16: Mr. C. E. Dailey, who has just returned from Willcox, gives a very flattering report to the *Citizen* of the mines at Dos Cabezas. The ledges are strong and wide, and cut through the mountain ranges. In one shaft the ore has averaged over $100 per ton in gold, and a few days ago a body of ore was encountered, which gives assays of $30,000 to $40,000 per ton. The gold is in white quartz, and there is but little of it of low grade. Some miners owning a claim there are erecting a five-stamp mill, which will be running in a few weeks. From the grade of ore they have on the dump, it is thought, they will easily take out over $1,500 per day. Mr. Daily is satisfied that these mines will prove more valuable than all the Quijotoas. The gentleman has the repution of being very conservative in his statements, but his praise of these mines is unreserved. All efforts at a boom have been discouraged, and the mines are being quietly and slowly developed, and show their merits to every judge of mineral rock.

DAKOTA.

CALEDONIA CAVE.—Black Hills *Pioneer*, August 16: Another cave has taken place in the Caledonia mine that effectually places that property back to condition that is no better than when it had nothing but a prospect hole. The cave of the old shaft some months ago occasioned the sinking of another. The new one was put down at a point only a few feet distant from the old. It was just completed, having reached the 300-foot level, Saturday evening last the miners discovered that the walls were giving way, and that a cave was beyond doubt. The foreman ordered all men up to await results. Yesterday morning it was growing worse, and continued to do so until the cave took place. The new shaft that, after two months' labor in sinking, is filled. The machinery used for hoisting went down, besides everything that was kept in the chamber. The ground fell from the surface, thus completely demolishing every vestige of shaft or hoisting machinery. It is stated that the Caledonia is now provided with no way for even a man to reach its ore body, much less produce rock for milling purposes. An entirely new shaft will have to be sunk. A miner acquainted with the Caledonia states that in one or two places a shaft can be lowered through good, solid ground, and that when the level is reached a drift of some 400 feet will reach the mine. At best, the mill is shut down for a period that will consume some three months. This fate to the rich Caledonia we deplore very much, as it was just beginning to make great promise. Since the clean-up of the Blacktail hydraulic company's flume, the ground washed out has been measured, and the yield was found to be nearly $2 per cubic yard. This we call pretty good placer mines.

IDAHO.

CŒUR D'ALENE.—Butte *Miner*, August 16: Mr. W. Y. Pemberton returned yesterday from Eagle City. Mr. Pemberton declares in the most emphatic terms that the Cœur d'Alene country is the richest in gold deposits of any now known upon the Pacific slope. Recent decisions by the Judge of the District Court, the first term of which has just closed there, have removed a cloud which has long hung over the place. Heretofore owners of many of the principal mines there have been silent concerning the output of their claims, and have done but little work, from the fact that their ground was in litigation, and they didn't care about developing it, not knowing but it might pass into other hands through a decision of the court. And then again, as the title of their claims was in dispute, business men were not inclined to extend credit to the claimants, and hence doubt and uncertainty were felt upon every hand. This is now all removed. Claimants feel secure in the title to their ground, and the work of development and extracting the precious metal has commenced with renewed vigor and attended by the most encouraging results. The output of gold has largely increased, credit is extended to claim owners who desire it, more men are being employed in the mines, and a successful mining season is assured. Mr. Pemberton says that wherever bedrock has been struck, gold in paying quantities is found, without exception. A very important factor in the prosperity of the country is the "old channel diggings," discovered upon the mountain side above the creek. These diggings have been traced for a distance of 25 miles, and the ground located. Men pack the dirt in sacks down to the creek, and make good wages every day in their clean-ups. A ditch is being built which will cover all these old channel diggings. When it is completed and the hydraulics get to work, the output of gold, Mr. Pemberton thinks, will be enormous. Bedrock has been reached upon but one claim in Eagle creek—the Maggie. It is 32 feet to the bedrock, and 3 feet of gravel, yielding $7 to the pan, was found upon it. The side gulches are all paying well where water can be obtained. But little is being done in developing quartz lodes. The "Mother lode" has been stripped for a distance of about 60 feet, and shows free gold in profusion. Keeler & Co., the owners of the famous "Widow's claim," will increase their working force to 75 men. Other companies will also employ a larger number of men. Town property is not much in demand. Timber is plenty, water abundant, and all the facilities for mining at hand. Mr. Pemberton thinks the country will not be worked out during the next 25 years.

NEW MEXICO

ORGAN TONES.—Cor. Rio Grande *Republican*, August 6: Kline & Co. are down on the Gray Eagle about 120 ft. The Memphis has shut down, but strong hopes are entertained that it is only temporary. The Smelter is running and turning out some fine bullion. They have over 20 men on the pay roll. Messrs. Newland, Throyer and Edwards are still at work on the Montrose, with a fair outlook for plenty of mineral. Dr. Burt is taking out some very nice ore from the Toughnut, and Duncan McCowen has three or four men on the Little Buck. Mayberry, McLaughlin and Rennard are down from San Andres. They report a better outlook than ever, and are sanguine over their prospects.

MONTANA.

MINES ABOUT MARYSVILLE.—Cor. Helena *Independent*, August 16: The contractor on the 30-stamp addition to the new Montana Company mill is now adding the finishing touches and soon 60 stamps will be dropping on the Drum Lummon ore with strong probabilities that many more will be erected in the future. Wallace Birkhead and B. De Camp have struck some very rich free gold rock in the Robert Emmet lode on Cruse Hill, west of the Drum Lummon. The find is not sufficiently developed to determine the extent, but is promising. Cotter and Hickey will soon have pans placed in the Whippoorwill mill to save the silver product of their Empire mine. In fact the success of the pan process at Gloster has demonstrated that to save a high per cent of the noble metals in this district iron pans are a necessity. It is undoubtedly a wiser course in Messrs. Vestel, Muth, Travor, and Rumping, organizing a company to develop and work the Empire, on Cruse Hill. This property is sufficiently developed to prove that it is a mine of value, and in time will return each owner a fortune. Marysville must be an overestimated place on the outside, judging by the number of persons coming into camp to find employment, and to go into business. The town is overdone in every branch, and still they come. Marysville—with the Drum Lummon, pure air, mountain scenery, and cord wood—has only one want, and that is capital to buy and develop some of the immense veins of mineral in the surrounding hills—veins that show as well and are as valuable as the Drum Lummon or Gloster were a few short years ago, and which to-day could be bought for a small figure, but in a few years will command a king's ransom. It is all folly to think that the Drum Lummon is the only mine in this section, any more than the Alice is the only one at Butte, the Little Pittsburg at Lendville, or the Horn Silver in Utah. There are any number of them here, and some enterprising capitalist will yet establish the fact. The great difficulty is that these claims are owned by men who are unable to develop and bring their value to light.

THE ANACONDA MINE. Butte *Miner*, August 16: The work on the Anaconda mine is going on as vigorously as usual, but the amount of ore taken out has not been so much as usual for the last week. This is due to the fact that as many hands as can be profitably used have been set to work both in the Anaconda and St. Lawrence mines to unite the two with a tunnel. The shipments of ore from the Anaconda for the past few days have averaged only about 80 tons a day. The shipments for the past month have been nearly 4,050 tons.

THE PARROTT SMELTER.—The Parrott concentrator (old works) after stopping for a few days for a general repairing, started again last week. The new works are rapidly progressing. Two of the new roasting furnaces have been fired up and are doing satisfactory work. The blast furnace is up and nearly ready for use. On Tuesday the converters came and yesterday were being set up and put in position.

JEFFERSON COUNTY MINES.—Cor. Butte *Miner*, August 16: Among the most valuable mines at Cataract may be mentioned the Boulder Chief and Butterfly lodes, owned by Wm. Morrow. The former is worked by a tunnel, which strikes a 4-foot vein of fine looking 40-ounce ore, at a distance of 111 feet from the mouth, and at a depth of 85 feet from the surface. The Boulder Chief is a well defined lead, which can be readily traced for over 1,000 feet, and upon which several prospect holes, varying from 10 to 25 feet, have been sunk. The vein is 27 feet in width, and the very smallest average assay from all the openings shows 40 ounces of silver. The ore is easily worked, and often pockets are found containing ore which will assay one-half silver. Mr. Morrow holds the property, in its undeveloped state, at $35,000. Mr. Charles Smith has commenced work on the Custer mine, owned by himself, George Fitschen, Peter Pfieffer and Henry Welder. The ore taken from the mine at a depth of 95 feet is much of it free milling, and shows assays from 20 ounces (the least) to 250 ounces. Five tons have just been sent to Boulder. The vein is 8 feet in width, so far as known, but as yet no hanging wall has been found. An occasional very rich find in all the mines of this district proves such an incentive that every owner of properties with even fair prospects is stimulated to push work forward to the full extent of his financial ability. The White Pine lode, owned by Pat. Early, Ebner Gile and John Olsen, has a shaft 50 feet deep, and shows a 7-foot vein of good ore, going nearly 50 ounces. It has been closed down for some time, on account of shortage in capital, but work is again resumed and will be continued right along. The Kit Carson is owned by Sam Hauser, A. M. Holter and Bob Gibbons. The mine is situated in the Low Lands, at the northeast corner of Elk Park, and is considered a most valuable property.

OREGON.

GOOD WAGES.—Jacksonville *Times*, August 16: Sargent & Sons, of Steamboat, are still engaged in mining, and are making good wages. Superintendent Ennis, of the Sterling mine, informs us that they have finished cleaning up for this year, and will soon commence fitting up for next season. Messrs. Prickett, Finney & Shearer, of Steamboat, have bought Beckner & Co.'s ditch, and are engaged in cleaning it out. They propose running on an extensive scale next season. T. L. Knox & Co., of Applegate, have bonded one of their quartz ledges to Portland parties for $2,000, who propose to put up a mill at once, and test the ore of this, as well as other ledges in that vicinity.

UTAH

REVIEW.—Salt Lake *Tribune*, August 18: The week has been rather quiet in mining circles, but the movement of the metals has been fair. The receipts of bullion and ore in this city for the week ending August 13th, inclusive, were $125,065.42, of which $113,705.42 was bullion and $11,900 was ore. The receipts of the week previous were $157,109.70, of which $141,999.55 was bullion. The shipments for the week ending August 9th were forty-two cars of bullion and forty cars of ore, shipped East. The shipments of Horn Silver bullion for the week ending August 13th, inclusive, amounted to eighteen cars of bullion of the value of $54,000, making the shipment to date, for the present year, $1,498,000, from which three quarterly dividends of $300,000 each, aggregating $900,000, have been declared and paid. The Ontario shipped during the week fifty-two bars of bullion, assaying $37,710.42, being a total product for the year of $1,023,497.79. The regular monthly dividends are paid promptly, and for the seven months declared, have amounted to $525,000, or $3.50 per share. The Crescent shipped one lot of ore, $1,850, and the Park City smelter sent in one car of bullion, $1,550. The product of the Hanauer smelter for the week was ten cars of bullion, $15,145. A correspondent writes as follows: "The Lead mine, Bingham, has been making regular shipments of ore, after the trouble they have had to contend with by the surface water getting into the mine through the old workings in the spring of this year, namely, by the old cave that occurred some eighteen months since. The mine has never looked better since it has been opened than at present, which demonstrates that, by judicious management and men who are miners in charge of the property, there are still mines in Bingham to be made to pay.

WASHINGTON TERRITORY.

THE CLE-EL-UM MINES. — Kittitas *Localizer*, August 14: The Polepick company is sinking a shaft on the Polepick mine, and have two arastras running on their own ore. The blacksmiths are laying in their supplies of coal from the Cle-el-um mines. One team went up Saturday and one Monday. Having four horses each they will bring one and a half tons to the load. The distance is from 30 to 35 miles to Ellensburgh. J. W. Stone is building a tramway below his coal mine, to be utilized for transporting the coal from the mine to the dump, where it can be loaded from the car into the wagon. The tramway will be a great convenience in the handling of the coal. Henry Livingston has been prospecting in the Swauk, Peshastin and Cle-el-um districts for the last three or four years, and has sunk a good many holes and run in on many ledges with no great encouragement. But we are pleased to state that he has discovered something lately that will do to tie to, and that will make him his fortune. Walter Elliott came down last week from the Swauk; he showed us several ounces of gold taken from the claim of Elliott, McClure & Slingsby. The gold is of a beautiful light color. The company has done quite an amount of work, stripping, etc., and are now washing up and reaping a reward for their labor. Henry Livingston and F. D. Schnebly have been prospecting in the Cle-el-um mining district a good portion of the summer. A few days ago they discovered a geniune lead of galena that carries considerable silver. No assay has been made of it, but they have a small bar made from it, weighing an ounce or more, that speaks for itself. It is clear galena, and where it came from there is plenty more like it. It is the richest of its kind yet discovered, and a sample of it can be seen in our office. Elmer Lockwood, of Peshastin, came down from that camp last week. He informed us that a new discovery on the Bodtail, one of the leads belonging to the Schaffer Co., has been made, of free milling ore, worth $10 to $60 per ton. Culver took some ore from the same a few years ago that went 25 cents to the pound. Two other discoveries have been made on the Schaffer company's ground. It is not known, however, how rich or extensive they are.

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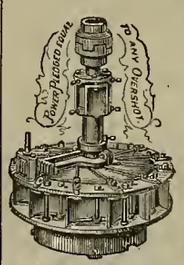

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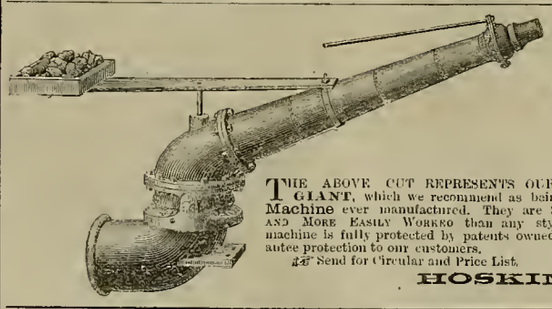

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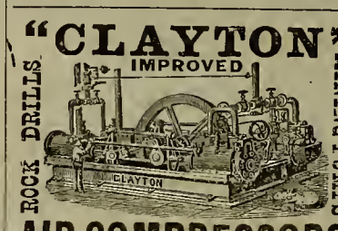

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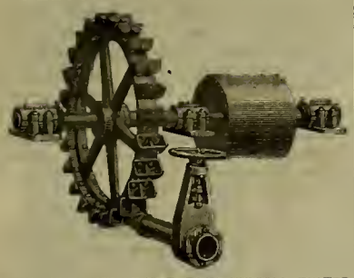

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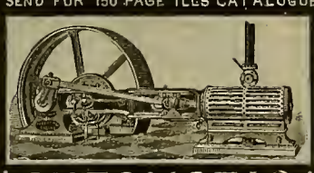

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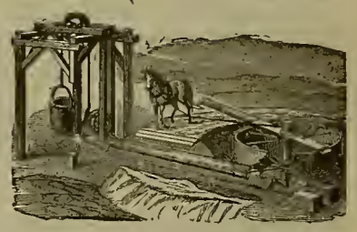

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The completion of the Northern Pacific Railroad, passing, as it does, through the Territory, has had the effect of greatly developing its resources. Agriculture, stock raising and manufactures have received an impetus, and the population has largely increased over the whole region. New towns are being built, and old ones enlarged, the whole Territory being exceedingly prosperous.

We have, during the past year, devoted considerable space in describing the resources of Montana, but such is the interest in the region that we intend making special efforts to set before our readers fuller information about the Territory. We are about to send an agent to visit Montana, and will shortly issue a sheet giving general and detailed information concerning the mines, farms, natural and industrial resources, climate, soils, settlements, mills, business interests, etc.

Mr. H. G. Parsons, an experienced and favorably known news publisher of San Francisco, will, during business vacation, represent the interest of this paper in Montana, collecting mining, agriculture and industrial information for our readers, and cuitivating on the part of the PRESS even closer and more useful relations, we trust, with our Territorial neighbors, for the future. We ask all friends of progressive industry there to help him in securing information for our columns and names for our subscription lists.

Mining Share Market.

Mining stocks continue quite dull. There have been no ore developments for a long time in the leading mines, and what few little spurts have occurred, have been brought about by the manipulators, independent of any special merit in the mines. As to the slim yield now resulting at even the big mines in the Comstock the following statement for the quarter, ending June 30, 1884, is to the point: Gross value, $670,657; total cost, $684,528.90. It cost $248,290.27 to produce $208,321.16 in bullion from the Yellow Jacket mine. Hale & Norcross yielded $15,205.61, at a cost of $11,928.73. Potosi yielded $58,233.03, at a cost of $56,903.03. Ophir yielded $22,030.39, at a cost of $22,041.76. Crown Point yielded $144,466.11, at a cost of $137,840.55, and Belcher $104,819.37, at a cost of $100,756.07. The tax on the net proceeds amounted to $4,040.87. Following were the values per ton of the ore: Belcher, $13.47; Crown Point, $12.67; Kentuck, $19; Yellow Jacket, $13.98; Potosi, $13.50; Hale & Norcross, $15.30, and Ophir, $11.60.

Bullion Shipments.

Horn Silver, August 13, $12,000; Ontario, August 13, $4,488; Park City, 12, $1.550; Wood River, 12, $5,200; Horn Silver, 12, $24,000; Ontario, 12, $11,733; Hanauer, 14, $6,805; Nevada, 14, $5,300; Ontario, 14, $4,597; Horn Silver, 14, $12,000; Hanauer, 15, $2,820; Crescent, 15, $3,000; Horn Silver, 15, $6,000; Ontario, 15, $4,521; Horn Silver, 17, $6,000; Tintic, 17, $5,000; Contention, 9, $9,712; Navajo, 18, $10,500; Syndicate, 16, $6,335; Horn Silver, 16, $12,000; Ontario, 16, $16,444; Hanauer, 16, $1,360. During the week ending August 16th, there were shipped from Salt Lake 13 cars of bullion, 38 cars of lead ore, 1 car of copper ore, and 1 car of copper bullion, making a total of 83 cars, aggregating 2,215,014 pounds.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
J. J. BARTELL—California.
A. S. DENNIS—San Mateo county.
A. C. KNOX—Nevada (State.)
B. W. CROWELL—Fresno and Tulare counties.
JOHN H. STURCKE—Santa Clara and San Benito counties.
GEO. MCDOWELL—Plumas and Sierra counties.
WM. PASCOE—San Francisco.
WM. H. COOK—Alameda county.
H. O. PARSONS—Idaho and Montana.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Arnold G & S M Co	Arizona	2	50	Aug 1	Sept 2	Sept 19	A Judson	320 Sausome st
Alpha Con M Co	Nevada	18	50	July 16	Aug 21	Sept 10	W Willis	309 Montgomery st
Alaska M and M Co	Alaska	7	1.00	July 22	Aug 26	Sept 16	E F Stone	306 Pine st
Boracic Acid M Co	California	3	05	July 21	Aug 25	Sept 15	H C Droger	309 Montgomery st
Best & Belcher M Co	Nevada	30	50	July 9	Aug 14	Sept 2	W Willis	309 Montgomery st
Beutou Con M Co	Nevada	13	25	July 22	Aug 26	Sept 15	W H Watson	302 Montgomery st
California M Co	Nevada	13	20	Aug 4	Sept 11	Oct 8	C P Gordon	309 Montgomery st
Caborca M Co	Mexico	9	05	July 18	Aug 22	Sept 22	H C Edgerly	328 Montgomery st
Con Amador M Co	California	7	50	July 21	Aug 21	Sept 10	P E Latham	408 California st
Chollar M Co	Nevada	14	50	July 23	Aug 26	Sept 15	C L McCoy	309 Montgomery st
El Dorado South Con M Co	Nevada	14	2.00	July 14	Aug 14	Sept 4	D M Kent	330 Pine st
Equitable Tunnel M Co	Utah	30	10	July 29	Sept 15	Oct 7	W A Van Bokkelen	419 California st
El Dorado Con M Co	Nevada	3	04	Aug 16	Sept 19	Oct 8	J H Sayre	330 Pine st
Enterprise M Co	California	1	15	July 1	Aug 15	Sept 5	W Van Bokke'en	419 California st
Golden Fleece G M Co	California	33	.50	.00	Aug 6	Sept 10	Sept 27	F Schermier	412 Sixth st
Humboldt Hill M & M Co	California	1		15	July 15	Aug 19	Sept 5	J Stadtfeld	419 California st
Martin White M Co	Nevada	18		25	July 25	Sept 4	Oct 2	J J Scoville	309 Montgomery st
Mayflower Gravel M Co	California	25		10	July 10	Aug 12	Sept 5	J Morixio	328 Montgomery st
Mono G M Co	California	21		50	July 8	Aug 12	Sept 1	G W Sessions	309 Montgomery st
Morgan M Co	California	11	1.00	July 3	Aug 30	Sept 22	C S Neal	309 Montgomery st
New York Hill M Co	California	8		20	July 28	Sept 2	Sept 23	J B Lightner	527 Clay st
Oleta M Co	California	1		10	July 26	Aug 30	Sept 20	T H Ganeard	8th and Market sts
Pittsburg M Co	California	10		05	July 11	Aug 15	Sept 5	G G Brooks	210 Front st
Potosi M Co	Nevada	16		50	July 29	Sept 2	Sept 23	C L McCoy	309 Montgomery st
Summers Con M Co	California	1		05	Aug 18	Sept 22	Oct 16	F E Luty	330 Pine st
Sunmit M Co	California	7		05	Aug 4	Sept 8	Sept 29	G W Sessions	309 Montgomery st
Santa Anita M Co	California	7		02	July 30	Sept 22	J M Buffington	306 California st
Utah S M Co	Nevada	50		50	Aug 18	Sept 22	Oct 11	C C Pratt	309 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Alaska M Co	California	A Judson	320 Sansome st	Annual	Sept 2
Arnold M Co	California	A Judson	320 Sansome st	Annual	Sept 2
Eureka Con M Co	Nevada	E H Willson	328 Montgomery st	Special	Sept 5
Murchie M Co	California	W Letts Oliver	328 Montgomery st	Annual	Aug 29
Real del Castillo M Co	Mexico	A Judson	320 Sansome st	Annual	Sept 2
Villagrana M Co	Mexico	A Judson	320 Sansome st	Annual	Sept 2

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	May 15
Bodie Con M Co	California	G W Sessions	309 Montgomery st	50	June 5
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	May 27
Idaho M Co	California			4.00	Apr 2
Jackson M Co	California	D C Bates	309 Montgomery st	10	Mar 16
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 21
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Apr 28
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Mar 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Apr 2

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 31.		WEEK ENDING Aug. 7.		WEEK ENDING Aug. 14.		WEEK ENDING Aug. 21.	
Alpha	1.15	1.60	.90	1.10	1.00	1.50	1.25	1.75
Alta	2.20	2.90	1.75	2.35	1.95	2.55	1.90	2.65
Andes	.40	.45	.30	.40	.25	.30	.25	.30
Argenta		.10						
Belcher	.90	1.25	.95	1.15	1.00	1.05	.85	.95
Beldiug								
Best & Belcher	2.30	3.65	2.15	3.05	1.75	2.85	2.25	2.55
Bullion	.70	.90	.60	.70	.55	.70	.55	.60
Bonanza King								
Belle Isle	.50	.60	.50	.60	.50	.65	.50	.85
Bodie Con	1.60	2.20	1.70	2.25	1.75	2.60	1.95	2.15
Benton	.40	.45	.30	.40	.40	.50	.35	.50
Bodie Tunnel								
Bulwer	.45	.70		.60		.60		.60
California	.25	.35	.10	.25		.10	.10	.15
Challenge	.20	.30				.25		
Champion								
Chollar	2.70	5.00	2.50	3.40	2.75	4.10	1.80	3.50
Confidence	1.15	1.30				1.00		1.00
Con. Imperial		.10				.05		
Con. Virginia	.35	.50	.25	.35	.25	.30	.25	.40
Con. Pacific	.45	.50		.25	.50	.55		.55
Crown Point	1.35	1.75	1.35	1.50	1.35	1.45	1.40	1.45
Day								
Eureka Con	2.60	2.75		2.10		2.50		
Eureka Tunnel		.50						.50
Exchequer	.35	.45		.35	.40	.50	.35	.45
Grand Prize		.55	.50	.55	.60	.75	.50	.60
Gould & Curry	2.20	3.70	2.00	3.10	2.20	2.50	1.90	2.30
Goodshaw								
Hale & Norcross	3.90	8.00	2.25	4.60	2.40	2.95	2.40	3.60
Holmes						2.00		
Independence		.25		.25		.25		.30
Julia								
Justice	.25	.30	.10	.30		.20		.30
Martin White		.25						
Mono	.25	.30	.25	.30	.60	1.75	.70	.90
Mexican	2.30	3.15	1.85	2.45	2.00	2.35	1.50	2.05
Mt. Diablo								2.00
Northern Belle								
Navajo	4.00	4.25	3.80	3.90	2.75	4.00	4.00	4.20
North Belle Isle							.30	.35
Occidental	1.40	1.60		1.25	1.10	1.15		1.25
Ophir	1.55	2.35	1.25	1.90	1.35	1.55	1.05	1.35
Overman	.25	.30	.20	.25	.15	.25	.15	.20
Potosi	1.45	2.75	1.25	4.75	1.45	2.15	1.00	1.85
Piual Con								
Savage	1.35	2.40	.90	1.45	.90	1.15	.90	1.05
Seg. Belcher		2.00				1.75	2.00	2.00
Sierra Nevada	1.60	3.65	2.00	2.65	2.20	2.50	1.35	2.10
Silver Hill		.10		.10				
Silver King		4.95				4.50		
Scorpion	.25	.50	.30	.40	.30	.40	.25	.30
Syndicate	.45	.50				.40	.40	.45
Tioga								
Union Con	1.75	2.70	1.65	2.15	1.70	2.00	1.05	1.50
Uta	1.70	2.65	1.40	2.00	1.40	1.65	.75	1.25
Yellow Jacket	2.10	2.60	2.05	2.20	2.00	2.15	1.95	2.00

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Aug. 21.

630	Alta	2.25@	2.30
100	Alpha		1.33
25	Bodie Con		1.90
10	B. & Belcher		2.30
750	Benton		.40c
1000	Belmont	1.55@	1.60
50	Belle Isle		.70c
400	Chollar		1.90
50	Crown Point		1.30
200	Exchequer		.30c
530	Eureka Tunnel		.55c
280	Gould & Curry		1.90
1000	Hale & Nor	2.80@	2.85
100	Holmes		3.00
175	Justice		.20c
450	Mexican		1.60
50	Mono		.65c
30	Navajo	4.00@	4.05
100	Ophir		1.20
15	Occidental		1.25
450	Potosi		1.05
200	Savage		.95c
90	Sierra Nevada	1.40@	1.45
100	Scorpion		.25c
200	Union		1.20
100	Utah		.30c
265	Yellow Jacket		1.75

AFTERNOON SESSION.

550	Alta	2.10@	2.20
140	Alpha		1.25
150	B. & Belcher	2.20@	2.25
100	Bullion		.50c
100	Bodie		2.10
700	Benton Con		.40c
1300	Belle Isle		.65@70c
10	Crown Point		1.45
1800	Con. Virginia	.25@	.30c
100	Chollar		1.80
50	Gould & Curry		1.85
550	Grand Prize		.55c
450	Hale & Nor		2.75
50	Mexican		1.45
450	Mono		.90c
500	Navajo		4.00
160	Ophir	1.30@	1.35
200	Potosi		1.05
200	Sierra Nevada	2.15@	2.20
100	Savage		.95c
200	Syndicate		.45c
20	Scorpion		.30c
50	Yellow Jacket		2.00

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

REMITTANCES to this office should be made by postal order or registered letter, when practicable. Cost of postal order, for $15 or less, 10 cts.; for registered letter, in addition to regular postage (at 3 cts per half ounce), 10 cts

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, August 21, 1884.

ANTIMONY—Per pound		@	—
Hallett's		13 @	—
Cookson's		14 @	—
BORAX—Refined		8½@	8¾
IRON—Glengarnock ton		24 50 @	—
Eglinton, ton		23 50 @	—
American Soft, ton		27 00 @	—
Oregon Pig, ton		@	—
Clipper Gap, Nos. 1 to 4		30 00 @	32 50
City Lane White		22 50 @	—
Shotts, No. 1		26 00 @	—
Refined Bar		3½@	3
Boiler, 1 to 4		5 00 @	5 50
Plate, 5 to 10		4½@	4¾
Nai Rod		7½@	—
Norway, according to thickness		6½@	7¾
STEEL, English, lb		15 @	25
Black Diamond, ordinary sizes		14 @	—
Drill		15 @	—
Machinery		12 @	14
COPPER—Ingot		15 @	—
Braziers' sizes		16 @	25
Fire-Box sheets		28 @	37
Bolt		23 @	—
Old		12½@	15
Bar		@	—
Cement, 100 fine		12 @	—
Copper in New York, Aug. 20		13¾@	13¾
LEAD—Pig		4½@	—
Bar		5½@	—
Pipe		7 @	—
Sheet		8 @	—
Shot, discount 10% on 500 bags: Drop, 1 bag		2 00 @	—
Buck, 1 bag		2 20 @	—
Chilled, do		2 40 @	—
TIN PLATES Charcoal		7 00 @	7 25
Coke		5 75 @	6 75
Pig		28 75 @	—
Banca tin		22 @	23
I. C. Charcoal Roofing, 14x20		6 25 @	6 50
ZINC—By the cask		19 @	—
Sheet, 7x3ft, 7 to 10 lb, less the cask		9 @	10
QUICKSILVER—By the flask		30 00 @	—
Flasks, new		1 05 @	—
Flasks, old		85 @	—

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First street, a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below costs, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. References as to above can be had upon applying to this office.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

Lost Papers.

If any subscriber fails to receive this paper promptly, after making due inquiries at the Postoffice, he is urgently requested to notify this office by *letter*, that we may send the missing papers, and, if possible, guard against further irregularities

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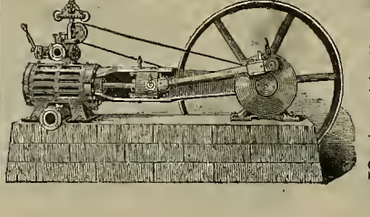

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & CO.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING AUGUST 12, 1884.

303,384.—ELEVATING APPARATUS—Ira Bishop, S. F.

303,493.—TREATING CIGARS—Jas. D. Culp, San Felipe, Cal.

303,504.—LIFTING JACK—L. P. Garcin, S. F.

303,511.—TUCKER FOR SEWING MACHINE—A. J. Hart, S. F.

303,575.—BOILER FEEDER REGULATOR—M. Jorgensen, Sonoma, Cal.

303,523.—FEED WATER HEATER—Daniel Lee, S. F.

303,440.—INDEX—Max Levy, S. F.

303,578.—OVERALLS—David Lubin, S. F.

303,535.—TRACTION CABLE GRIP—Wm. Martin, S. F.

303,394.—CAR COUPLING—T. H. N. McNamee, Lemoore, Cal.

303,447.—MACHINE FOR PULLING COTTON STALKS—C. E. Moser, Healdsburg, Cal.

303,405.—BEAM WHEEL—J. W. Stafford, Acampo, Cal.

303,469.—PAPER FILE—R. P. Traxler, S. F.

303,410.—REAMER—J. C. W. Wilson, East Portland, Or.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise), at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

STEP AND EXTENSION LADDERS.—Robert Walker, Oakland. No. 302,066. Dated July 15, 1884. This ladder is one that may be used as an extension or step ladder at will. It consists of two ladder sections united by a rod and slotted connections, so that the two parts being united at one end may be separated at the other in a manner of an ordinary step ladder; or by extending the two in line they may be locked together, so as to form a rigid continuous ladder of nearly double the length of either section.

SAFETY GUARDS FOR CARS.—Lewis Peterson, S. F., No. 302,024. Dated July 15, 1884. This safety guard for cars and other heavy moving objects, consists of a combination of devices. The principal object is to prevent such accidents to life and limb as are of frequent occurrence in cities, occasioned by persons being run over by street cars. The safety guard, patented, may be applied to cars and moving bodies of all kinds to prevent any object in front of the car from being run over or injured to any considerable extent.

WONDERFUL DEVELOPMENTS IN OPTICAL SCIENCE.—All complicated cases of defective vision most carefully tested after the most progressive method known to opthalmology, and, if any morbid changes are indicated, I will be only too happy to recommend the best opthalmic surgeon on the coast in time; especially in young children, where progressive myopia is manifested, and thereby induce parents to seek the advice of an oculist. It is a well known fact that the majority of near-sighted persons, especially if suited by a patent process, rest in fancied security, when their cases really need the attention of a pathologist. Near-sighted eyes are looked upon as unsound, with but few exceptions. All errors of refraction corrected with suitable glasses, applicable to myopia, hypermotropia, simple, compound and mixed cases of astigmatism. My lenses are made by the most skillful workmen of Paris, to order. Being constantly occupied in testing defective eyes, I have no disposition to lose valuable time in doing automatic labor at grinding lenses.

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California Inventors Should consult DEWEY & CO. AMERICAN AND FOREIGN PATENT SOLICITORS, for obtaining Patents and Caveats. Established in 1860. Their long experience as journalists and large practice as Patent attorneys enables them to offer Pacific Coast Inventors far better service than they can obtain elsewhere. Send for free circulars of information. Office of the MINING AND SCIENTIFIC PRESS and PACIFIC RURAL PRESS, No. 252 Market St., S. F. Elevator 12 Front St.

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2. The Oils generally used in the West, cost too much money.

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Ingersoll, D2 3", large ports	1.785	ft. per hour.
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National, improved, 3½"	1.280	" "
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Ingersoll, D2 3", beat Rand 3½"	.744	" "
Ingersoll, D2 3", beat National 3½"	.595	" "
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National beat Rand	.139	" "

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This machine has been thoroughly tested for the past two years under a great variety of conditions giving most extraordinary results, far in advance of anything ever before realized.

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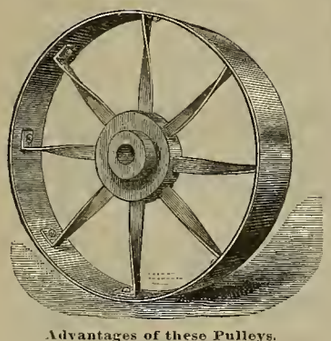

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They are *the only pulley of the kind* which runs true. They cannot be broken in transport.

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Yours faithfully,
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[Signed:] RICHARD T. MARSH, Managing Director.

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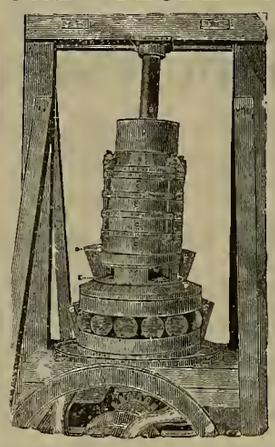

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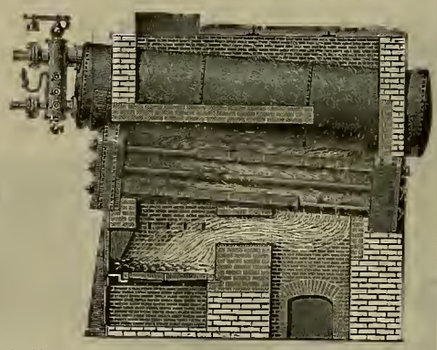

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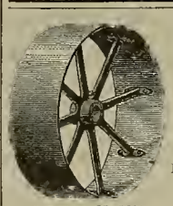

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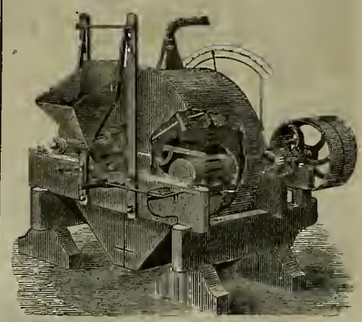

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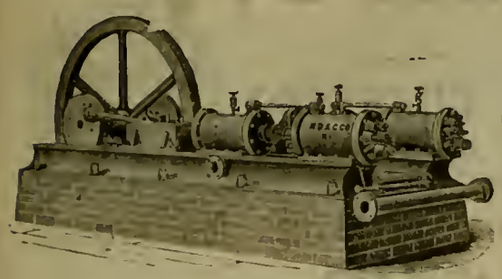

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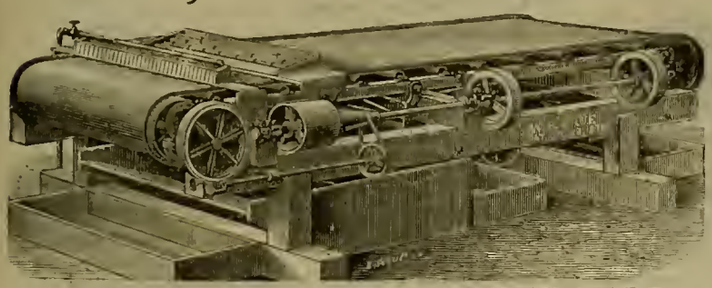

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That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That we are and have been ready, at any time, to make a competitive trial against the Triumph, or any other machine, for stakes of $1,000.

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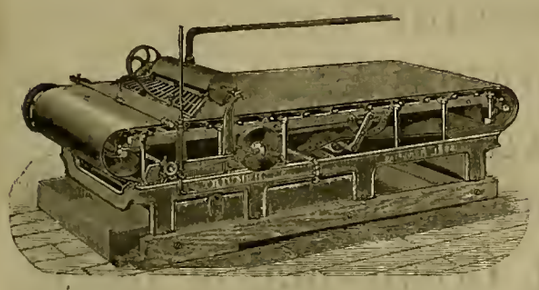

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These returns do not include the value of the amalgam saved by the "Triumphs" during the test; which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarily saved, which is lost on the "Frue" Vanners.

This trial was conducted under the personal supervision of the Manager and Superintendent of that Company, in a strictly fair and impartial manner, and with the sole view of determining, in the interest of that Company, the merits and demerits of the respective machines by a thoroughly practical test. A relation of the course of procedure, a concise analysis of assays, and a tabulated statement of the net bullion results, with accurate deductions therefrom, will soon be published in Circular form.

The superiority of the present construction of the "Triumph" over the form originally introduced, together with the demonstrated results of the above, and other trials had with the "Frue" Vanners, induce us to and we hereby accept the Challenge of $1,000, flaunted by the Agents of the "Frue Vanning Machine Company," and hold ourselves in readiness to enter into a second competitive trial for that sum, at such place and upon such terms and conditions as may hereafter be mutually arranged.

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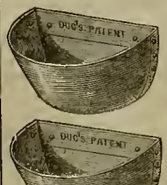

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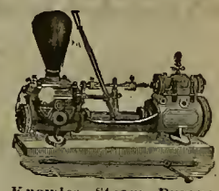
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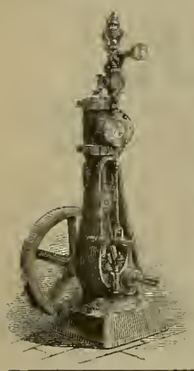

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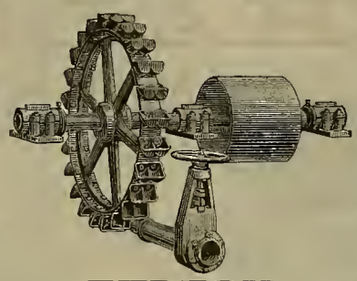

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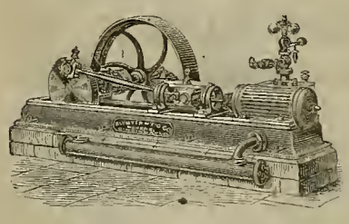
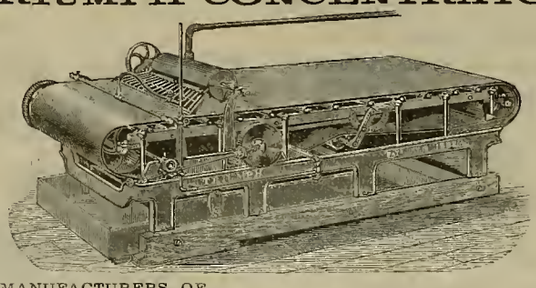
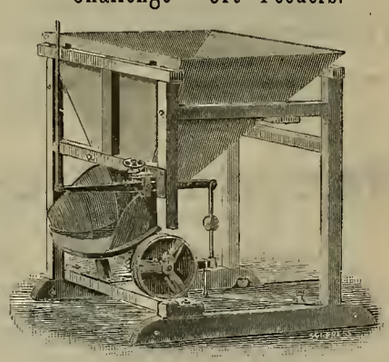




"Challenge" Ore Feeders.



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MINING AND SCIENTIFIC PRESS.

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VOLUME XLIX. Number 9.

The Frue Concentrator.

There is at this time a very decided interest manifested in the subject of ore concentration, and the question of the relative merits of the different concentrators on the market is being discussed with some spirit. The Frue vanner seems to be the basis of comparison for other makers, owing to its successful work, and the fact that it has of late years been largely introduced, and has displaced types in use before the belt machine was brought to the attention of the mining public. It is a compliment to the Frue machine for the makers of other forms to try to perfect theirs so that they will do equally as good, or better work; and as this business rivalry can only result in benefit to the mining public, by producing perfect concentrators, we have deemed it advisable to present to our readers the statements of the different manufacturers, with some description of the various machines.

In the last two numbers of the PRESS appeared descriptions of the Triumph and the Duncan concentrators, with statements of work performed as compared with that accomplished by the Frue vanners. To some of these statements Messrs. Adams & Carter, the agents of the Frue vanner on this coast, take exception, and it is but just that their side of the question should be presented. In an interview with these gentlemen this week, the following points were elicited:

The Frue Vanning Machine Co. are protected by many patents issued from 1869 to 1883, and they are now applying for other patents; the various combinations of shaking tables with endless uphill traveling belt are thoroughly covered by patents owned by the Frue Vanning Machine Co.

As regards the Duncan Concentrator at the Carlisle mine, the facts, as known to Adams & Carter are as follows:

"Last February or March the Eastern agent of the Frue machine found the loss very heavy in the tailings from the six Duncan Concentrators at the Carlisle mill. He offered to put in five Frues (to concentrate the Duncan's tailings), with the understanding that if the results were satisfactory, the Carlisle Company would accept and pay for the Frues; his proposition was accepted, and the Frues were put in. The result was that the Carlisle Company paid for the five Frues and ordered and paid for *five additional Frues*. Would this have been done if the work of the Duncans was superior to that of the Frues? Most decidedly not."

As regards the trials of the Triumph and Frue machines recently referred to, Mr. Adams says it is well to bear in mind the fact that the Frue Vanning Machine Company claim the Triumph concentrator to be an infringement on some of their patents. They sued an Eastern end-shake machine (the Embrey); and after a long suit found that their opponents had not sold enough machines to cause sufficient damages to cover expenses of suit; but they now own the patent for the same, and now propose to wait until there are a few more Triumphs in use before commencing suit against it. Owning the end-shake machine (the Embrey) of an earlier patent, the Frue Company can put a machine with an end-shake on the market if they feel so disposed. So if there was any special merit in this end-shake motion it could be utilized by the Frue Company without risks of infringement suit; and if it was considered superior to the side-shake they would have used it before this.

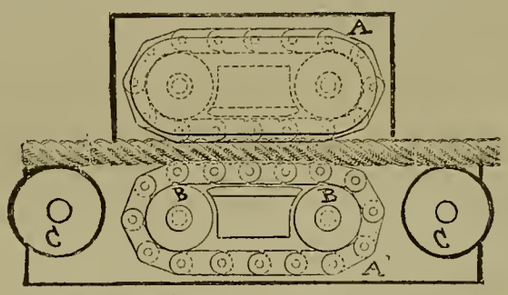
The Frue agents contend also, in the matter of the trial, that "40 ounces of amalgam was not saved on the two Triumphs; the correct amount was only about one ounce, worth perhaps $4 50, not $180; yet the statement is given as if part of the Superintendent's report. And here it may be stated that, in a well-conducted mill, the amount of amalgam escaping from the plates is very small. It is also claimed that the amalgam-saving arrangement of the Frue is much simpler and just as effectual as that of the Triumph. Shaking riffles and copper plates have been used on the Frue vanners or concentrators since 1878, where needed to save amalgam."

"During the trial referred to the Frues worked under the great disadvantage of too much water; but the superintendent refused to allow the amount to be reduced, although repeatedly urged to do so; and he was informed in plain language that the Frues could not do their usual perfect work, as they were forced to use too much water from the battery. Is it fair to expect the best results under the circumstances?"

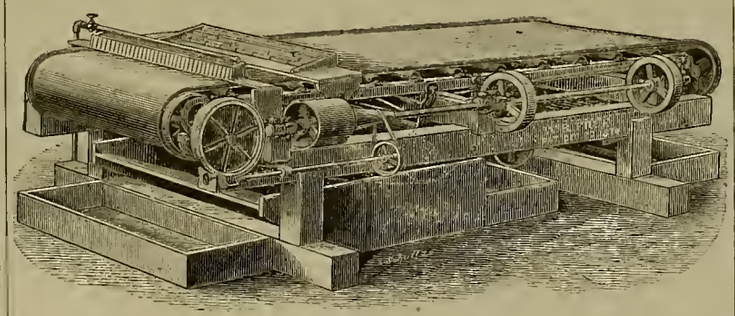
"Still the tailings from the Triumph concentrators assayed one half higher than the Frue tailings, and there was but little difference in the values of assay of the Frue and Triumph concentrations; the difference in the final returns apparently occurred in the roasting and chlorination."

"In regard to the advertised acceptance of our $1,000 challenge, we sincerely hope that our challenge will be accepted, for we are confident of winning in a fair trial; but as the Triumph people have already twice accepted our challenge and then backed out, refusing to put up the money, we fear this is but one more attempt to make capital cheaply by advertising what they have no intention of performing."

The engraving on this page shows the general form of the Frue machine, which is now so well known that it is not at all necessary to give any detailed description. Within the past six weeks seventy of these Frue machines have been sold on this coast; for one mill alone forty eight Frues have been ordered. The company ordering them was informed of the results of the test referred to, and although special inducements and extremely low prices were offered by other makers, the Frues were ordered. After thorough examination and investigation the company became convinced of their great superiority in both construction and durability as well as the superior work performed by them.



TAYLOR'S ENDLESS-CHAIN GRIP FOR CABLE ROADS.



THE FRUE CONCENTRATOR.

MAP OF MEXICO.—A new map of Mexico, compiled from official surveys of the Public Works Department of Mexico by A. F. Labadie, has been published in this city by Gregoise Tanzy & Co. It is a very complete and useful map. It gives the routes of completed railways, railways in course of construction, public highways and roads, telegraphic lines, lines of steamers on coasts, etc. The sudden impulse given to our trade and commercial relations with our sister republic has created an interest in that country, and this new map will be found useful to all having business with any part of Mexico. The maps are sold in pocket-book form for $2 50.

THE Calumet & Hecla copper mine, Michigan, has paid out in dividends a total sum of $25,150,000, which, with the exception of the dividends by the California and Consolidated Virginia Mining companies, is the largest amount ever paid to the stockholders of any mining company in America.

A New Cable Grip.

On this page is an engraving of a new style of grip for cable railroads (now becoming so popular), which is ingenious and simple in construction. Various styles of grips have been invented and described in these columns. Several modifications have also been tried of the so-called solid grip, which is simply an iron vice, with one jaw upon one side of the continuously moving cable the other jaw, upon the other side, with each jaw having a semi-circular groove, the jaws made to approach and recede from the cable for the purpose of starting and stopping the car.

Roller grips have been tried and abandoned, because the contact of the grooved rollers is so small upon the rope, that so great pressure is required to prevent slipping, that the cable is soon injured.

The solid grips have been made of iron and other metals, and even with wood linings, and this style of grip is about the only one in use now, for the want of something better.

This ingenious grip which is here described, was invented by Mr. H. R. Taylor, of this city, and is specially designed to prevent the wear of the cable by transferring the wear (consequent upon a continuously moving body, being made to move or overcome the inertia of a body at rest), to certain parts of the grip, which parts can be quickly and cheaply replaced. The cut does not need much explanation. The wheels *B*, are enveloped by an endless chain *A*. The links and chain are square. The inner flat edge runs upon the rollers, which of course are turned flat to receive them. The outer portion of the chain conforms to the circle of a section of the cable and the chains, one above and one below or one at each side, always move with the cable when in contact with it. Between the rollers *B*, and at the back of the chains are placed lugs which by the mechanism that opens and shuts the grip, are made to press the chain upon opposite sides of the cable, and at this point or upon the surface of the lug and inner side of the chain is the friction and wear. This chain and lug are cheaply replaced, and the expensive cable allowed to move and run for a great while unharmed.

The further advantage of this style of grip is that the sudden jerking of the car at starting will be avoided, because the pressure upon the cable can be made gradually, without wearing it. This chain can be placed upon most of the solid grips now in use without much change or expense.

The chains, *B*, can be easily and cheaply made and a supply kept on hand to replace those worn. The form of these links where they join each other is so made that the groove which is to conform to the section of cable is preserved, whether the chain lie in a straight line or in a curve, so no sharp corners are presented to the cable.

The wheels, or pulleys, simply support the cable, while the system of chains are drawn away from it. The wheels, *B*, and chains, *A*, nearly to their outer edges, are covered with iron plates to keep out dirt and sand.

Mr. Taylor invented this and secured letters patent in 1876; also the past year in this country and in England. It has been examined and admired by many engineers and mechanics and scientific gentlemen. A model of Mr. Taylor's grip can be seen at his office, 120 Market street.

The Scrap Iron Trade.

To the average observer the scrap iron trade is of little importance and represents but a few persons, and the most of those of very indifferent make-up—unwashed, unshaved, mounted upon rickety wagons drawn by old and decrepit horses. The business of collecting also furnishes occasional employment for an army of boys, mostly of the hoodlum type, a large portion of whom find their supplies in poorly enclosed back yards, from whence they are removed by stealth to the junk dealer, who asks no questions as to how or where they were obtained, as long as he makes his purchase for a mere moiety of its true value.

But back of all this there is a large and important industry, employing many men and much capital—an industry which turns much waste to profit, and one which of late years has been reduced to quite a thorough business system.

Contrary to the usual idea, the chief portion of the scrap iron, especially in the United States, comes from the country. Notwithstanding the numerous gatherers, with their rickety old wagons and unintelligible cries, which are constantly met in our streets, the city furnishes a comparatively small part of the "scrap." The country buyers furnish the larger portion for the trade. The wasteful neglect of farmers furnishes tons upon tons of broken and rusted farm implements, which a little care might have preserved and rendered serviceable for many a year longer. The Americans are much more careless in this particular than any other people. Europeans use less tools and take better care of what they do have.

In California, until since the establishment of the Pacific Rolling Mills, scrap iron had but little value. It would not pay to collect and ship East, consequently immense quantities of old iron and steel were thrown into out-of-the-way places, where it was suffered to pass into slow decay by rust or be buried out of sight and knowledge by the gradual accumulation of other rubbish. But of late years all this has been changed, and immense quantities of "scrap" are now being received at the iron works on the Potrero. Those works have also been the recipients of large quantities of old iron from foreign ports, originally from Valparaiso, but recently from Europe, in about 500 ton lots. The Chilians are the Yankees of South America, and are more noted than any other people on that portion of the American continent for their industrious and economical habits. Wagons are employed there to traverse all through the interior of that country for the special purpose of collecting old iron, which is hauled to Santiago, thence by rail to Valparaiso, whence it is shipped to this port, and at a handsome profit. Entire cargoes are sometimes thus collected and delivered.

The bulk of scrap iron used in San Francisco comes from abroad, mainly in 500 ton lots, taken by the ships for dead weight. A large portion comes from London, and a good deal from Antwerp and Hamburg. In London it costs about 50 shillings, the duty is about 27 shillings, and average rate of freight about 20 shillings per ton.

The Valparaiso shipments, formerly so heavy, are comparatively small now. The European scrap iron can be had for less money and is of a better grade and more carefully selected. The scrap is all sorted before being shipped, and is ready for use on arrival.

There are only three local buyers of scrap iron in quantities here—the Pacific Rolling Mills, the Judson Manufacturing Co. and the Pacific Iron and Nail Works.

They consume among them probably over 12,000 tons of scrap iron a year. There is more or less collected on this coast, which must of course be consumed here, for it will not pay to ship away! It is worth about one cent per pound, against $25 to $26 per ton for foreign. That here has to be sold in this market, while that from abroad has to bring a good price or it would not be shipped to this port. The Central Pacific has for some time been selling its old iron rails. There are about 2,000 tons of foreign scrap on the way to this port now.

But whatever its source, "scrap" iron comes to the large buyers in a more or less mixed condition, and has to be sorted before it is ready for the final buyer or the furnace. This sorting is a very important and careful business, and should be done by very honest experts, as upon it depends not only the final value of the scrap, but also of the resulting furnace or forge produce as well. Valuable metals, differing in kind, may be so mixed by the sorter, as to quickly reduce the average cost of all. The presence, to any considerable extent of steel in iron or iron in steel, cast in wrought or *vice versa*, or lower of any kind mixed with a higher grade diminishes the aggregate value for any use, and not infrequently utterly destroys its usefulness for special purpose. The cost of sorting is usually about one dollar per ton, except in very small and badly mixed scrap, when it may largely exceed that amount.

The usual classifications are: No. 1—wrought machinery, stove-plate, steel tires and wagon springs, old plow and plow steel. No. 2—wrought, wrought iron turnings, cast iron borings, malleable scrap and old rails. There are several other classifications sometimes made, but seldom used.

Pacific coast consumers have taken the standard of New York and Philadelphia for number one scrap iron. The specification is as follows: "All wrought iron, round, square or flat, except plates (unless such plates are cut apart and free from angles) one quarter of an inch thick and upwards, shall be accepted as number one wrought scrap iron; but it must be free from rails or rail ends, gas pipe, flues, hoes, shovels, hoops, wire and all similar light iron, and from cast iron, tin and steel."

In making up scrap for the furnaces, the sides and heads are made of pieces of rails, and the center is filled in with miscellaneous scrap, the bundle being secured with wire.

A writer, speaking of the uses to which scrap iron is put, says: "All kinds of scrap are used in many ways and for many purposes. Wrought scrap is usually put in the furnace in piles and reworked into merchant iron. For this purpose it must be fairly free from cast iron and steel. In reworking wrought-scrap forging iron especial purity from the other grades of scrap is essential, a slight admixture of steel or cast scrap rendering it liable to shiver. Machinery scrap is worked up in various ways, piled, balled, etc. Old sheet iron is used for bottoms in puddling, and is not infrequently sunk in charcoal fires and worked into wire. Steel rails are treated in an open-hearth furnace, and used for a number of purposes, going largely into wire rods. The same may be said of steel tires. All classes of cast scrap are pretty generally used in the foundries for casting, though the better grades are sometimes puddled. It is common to puddle stove-plate. Cast borings are treated in the same way as the other kinds of cast scrap. Boiler-plates are usually made of charcoal iron, and the scrap is for the most part sheared and worked into refined iron. Wrought turnings are used in hushelling or puddling furnaces, and are worked into bars. It is so used by a large number of mills. This species of scrap is often sunk in charcoal fires and made into boiler-plate. It is also worked up into nail-plates, etc. The foundries and merchant-iron and nail-plate mills are the largest users of scrap, but its use is by no means confined to these. Old steel rails are sold almost universally by the long ton of 2240 pounds. For other species of old metal various rules as to net or long tons prevail at the East. In the West the net ton is pretty generally accepted."

Gold Mining.

It is evident that a renewed interest is beginning to be felt on the part of mining men in gold-producing mines, as at the present time there is more activity and more new enterprises in the quartz fields of California than for many years past. Several causes have arisen for this. In the discovery and opening up of the riches of the Comstock a great impetus was given to silver mining, as it was believed that more profitable results would follow from that character of mining. In consequence the search for and development of silver-bearing lodes has extended over a vast field, demanding the investment of immense capital and the employment of the largest portion of skilled mining labor. The effect of this was to cause a comparative neglect of gold quartz mining, and the quartz lodes of the western slope of the Sierras, which are more marked and extensive than on any part of the continent, have been left mainly for development to local effort, unaided by the capital that found more attraction in seeking silver. By this partiality on the part of mining investors the product of silver has been unduly stimulated, and gold, the more precious and more necessary metal to the commerce of the world, has not been produced in anything like the quantity for which there has been a demand. Although gold mining has suffered from this want of encouragement, yet it has held its own better than might have been anticipated, and for the reason, as experience has shown, that with increased knowledge of the characteristics of gold-bearing veins, improvements in mining appliances, and better business methods in the conduct of the business, there is as much certainty and profit as in other classes of mining. The existence of pay chutes, their direction according to the dip of the vein, are ascertained facts which now relieve much of the former uncertainty connected with gold mining, so that it is now a mooted question whether in a well-defined fissure vein the pay chute really becomes exhausted, as the deepest workings have failed to settle this point. Silver veins, on the contrary, have ore bodies of richness, and then barren zones that give an element of uncertainty to this class of mineral-bearing veins that makes a hazard that is attended with frequent and enormous loss, of which the Comstock lode is a notorious example. Gold mining is not attended with the same expense as that for silver, as, the lodes being smaller, less costly machinery plant subserves the purpose; and hence it is that individual effort or companies of moderate capital have gone on with the development of mines even while mining capital has given but little encouragement.

But the gold quartz veins of California are not to remain in the future as in the past, if we are to judge by appearances and the disposition being evinced by mining men to give more attention to gold production. The gold is planted in the veins of the Sierras, and the world needs and must have it, and because of this there must be a stimulus to gold mining that will prove a resultant prosperity to numerous mining districts, among which is that of Grass Valley, the pioneer quartz mining district of California, which has always maintained and yet asserts its pre-eminence in the industry.—*Grass Valley Union.*

The Art of Fusion.

If a detailed history of the art of melting could be written it would be found to be as full of interest as that of any other of the arts practiced in the manipulation or the manufacture of metals. It has been well known from the earliest time, and it is certain that it was the first to be largely used, as distinguished from the art of forging or of welding, and of brazing or riveting.

The effect of heat in producing fusion or a softened and melted state is at the present day one of the first points to be noted with accuracy in any examination or testing of a new combination of metals. It is also an important guide to those who are aiming to improve the quality of the metals long known and used in the arts.

If the iron workers of the present day have more resources at their command in the finer qualities of iron and steel which they employ, than the smiths of ancient time, it cannot be said with strict truthfulness that the results of their handicraft have always been proportionate to the abundance of these resources, or such as to fulfill completely the demands which have been made upon them. It is rare that all lines or departments of an art advance with equal steps, and so it is sometimes found to be true that one will be supplanted by another for a time, and that some incidental or collateral advantage will afterward lead to a return to the use of the first. The process of welding for some purposes has at times seemed certain to take the place of riveting, but an immense increase in the sizes of plates and bars which it became practicable to roll, has turned the scale again in favor of the methods of riveting and pinning for the joining of parts to each other.

There are many reasons for believing that the earliest developments in the use of metals were the result of accidental application of fires to them as they existed in their ores; but it is also certain that these chance indications were followed by the most painstaking study of the possibilities of each case, and that the remarkable examples of ancient metal work were in no sense due to any lucky accident, but rather to the skill developed by watchfulness and careful trial of the same methods day after day.

So, also, just now the attention of builders of heavy machinery, and even of large sizes of guns, is turned with deepest interest, and even with great anxiety, to the advance in the art of fusing or melting the high-grade metals, the various qualities or grades of steel of which these heavy pieces are to be made. The progress actually made in this art in this respect is quite sufficient to warrant the fullest expectation that has thus far been entertained of it. The prospect is very clear that with the daily experience of many foundries in the study and practice of the art of fusing that stubborn but valuable metal, steel, the day is close at hand when the more compact and massive pieces or parts of all kinds of machinery will be made of it, to the great advantage of all concerned.

This very important result is due solely to the study and constantly advancing practice of this oldest of all arts in metals, and to the improvement made in the apparatus employed. In this respect, the advance from the time of the mediæval workers is simply incredible; and, indeed, the short space of thirty years covers nearly the whole span from the day of a trifling capacity of furnace for melting to the present time, when the limit is rather the power of existing apparatus to move the finished casting.

In connection with the above, which we clip from the *Manufacturers' Gazette*, the following paragraphs from the *Jewelers' Journal* will also be read with interest, and possibly to the instruction, of some of our readers.

Composite Metals—Alloys of Copper.

Corinthian brass was said to be a mixture of gold, silver and copper, formed by the running together of statues melted in the flames of the city of Corinth when it was burned by its Roman captors. It brought a very high price for generations afterwards. The name "brass" was commonly applied among the ancients to what is now known as bell or gun metal, a mixture of copper and tin. The alloy of copper and zinc was known and used ages before the mixture of the latter metal was discovered; and it is even said that the use of brass was discovered before that of iron. A mass of zinc ore, mingled with charcoal and plunged into melted copper, will yield the metal, which will be at once dissolved by the copper. This was the ancient process, the only one till 1781, and is still in use. Modern modes consist in melting the zinc, and adding copper in thin strips, or in a fused state; or in melting copper and plunging it into lumps of zinc, held below the surface with iron tongs. At the temperature of melted copper, zinc is very apt to evaporate, and, despite layers of fine charcoal or glass on top of the fluid metal, so much zinc passes off that chemical analysis alone can determine the proportion of each metal in the product. The usual proportion is a pound of copper to eight ounces of zinc. "Prince's metal," a beautiful yellow combination, contains equal weights of each ingredient. "Muntz's patent sheeting, or yellow metal," is made of about two pounds of zinc to three pounds of copper. Bath metal, pinchbeck, or Mannheim metal, is made of three or four ounces zinc to a pound of copper. The addition of zinc hardens and whitens the copper. Oxide is also a combination of copper and zinc in the ratio of 100 to 17. Brass can be precipitated from a solution of sulphurets of the two ingredients mixed with cyanide of potassium, by using a galvanic battery with a brass plate attached to the negative pole.

Probably there is no metal capable of producing so many very distinct alloys as copper. These different alloys are distinguished as much by their characteristics as by their color, and in the latter case the color may be made to vary from the red of the original copper to the almost blank white of silver. Take the composition of the widely used Babbit's metal, employed throughout the world as bearings for journals and in other places where friction comes. It is nearly pure white, and yet out of 100 parts of tin, antimony and copper, the copper makes one twenty-fifth, the exact proportion being: tin, 89; antimony, 7.3; copper, 3.7. And there are bronzes used in the arts which have so slight an admixture of lighter-colored metals with the copper as scarcely to change the color of the original and basic metal. Then the uses, the qualities and the purposes of these varying compounds are not equaled by those of any other basic metal. In iron the compounds, or changes, rather, are so slight that it is a puzzle, as yet not entirely solved, to discover and produce the exact change from fibrous wrought iron to crystallized high steel. There are mediums between these two extremes, but these are the extremes, and to produce these from the original metal, and to produce any of the grades between, requires a nicety of manipulation and a knowledge of chemistry and metallurgy that it takes years of application and patience to compass.

MILL WORKINGS.—In the report of the Superintendent of the Navajo mine for the fiscal year, is the following statement: The mill run covers a period of 229½ days, of which the actual running time was 227½ days, showing a loss of 2½ days, including all stoppages of every nature incidental to a mill run. Milled 2243 1-10 tons of Navajo ore, and 121 1-20 tons of custom ore. The average battery pulp assay of the ore from the Navajo mine was $104 03 per ton, and was worked to 91 93 per cent of the battery assay. Custom ore averaged $122 81 per ton, and was worked to 91 per cent. The ore milled the past year was not of that character that would permit of the same quantity being crushed per stamp, and of being worked to quite as high a percentage, as the ore that is to be milled the coming year. At the commencement of the fiscal year just ended, the mill was undergoing repairs and improvements, necessitated by the long run made the year previous. The same was completed and milling resumed in November. Since which time, in view of the large amount of work for it in sight, it is hardly necessary to say that it has been kept in a good state of repair, and that its present condition guarantees the usual excellent results that had been attained in the previous years.

NEW SHAKING TABLE.—The *Salt Lake Tribune* says: Mr. Dyer, of Park City, was in town Wednesday evening. He says the tramway of the Crescent, the concentrating and sampling mills, will all be finished in the next thirty or forty days. Although it is not considered good policy for Superintendent Ferry to crowd the mine during the depression in lead, fifty or sixty tons a day are being shipped from the mine, and every ton taken out, paradoxical as it may seem, appears to disclose two additional tons not visible before. The ore concentrates finely. Some of it has been taken to Bingham and tried. It is said, by the way, that they have perfected a shaking table at Bingham that works cheaper and cleaner than the jig; that is cheaper in first cost, and that separates the lead from the pyrites. It comes to us rather indefinitely, but if true, it is of vast importance to Bingham, to the smelting and other incidental business interests of this city and valley.

ANCIENT GEOGRAPHY.—The bibliography of Ptolemy's geography, which Mr. Justin Winsor has been printing by instalments in the Harvard University *Bulletin*, has been issued separately, in advance of its completion in the *Bulletin*, and forms an interesting contribution (forty-two pages) to historical geography. It is particularly valuable for the information it gives regarding the early cartography of America, and the ante-Columbian views of the coast west of Europe. Such collateral matter seems to elucidate the subject. The name 'America' appears for the first time on a Ptolemaic scale in 1522; but reasons are given for believers that it occurred in print or in manuscript as early as 1513-15. It appears that copies from 1478 edition have been sold at eighty, ninety and a hundred pounds.

Bradstreet's says that times of industrial depression are prolific in discoveries and economic improvements that revolutionize almost the conditions of industry. Although there is no depression to complain of in our mining industry, there are signs that the problem of working millions of tons of low grade Bingham ores at a profit may be solved within a twelve-month.—*Salt Lake Tribune.*

THE new concentrator at the head of Carr Fork, Bingham, Utah, has been started up, on ore from the Frisco. The first run was a success, and fully justifies the owners in their enterprise.

JAPAN has a fishing population of 1,601,406. At their last National Fisheries Exhibition the Japanese showed 3,967 articles connected with fishing, and 6,474 kinds of goods made from fish aquatic plants.

MECHANICAL PROGRESS.

Improved Method of Generating Steam Power.

Much interest is felt among experts and others who are concerned in the manufacture and use of steam-power apparatus in the successful working of the new method of developing steam power, which is being introduced by the New England Motive Power Company of this city. The apparatus is in constant use at the works of the Hollowell Granite Company on Medford street, in the Charlestown district. It has been in use there some ten weeks, and gives entire satisfaction in respect both to the economical development of power and the saving of fuel, i. e. about 50 per cent of coal is saved, and the same amount of power is now developed by the use of one boiler of fifty-horse power that formerly was produced by this boiler and another one of thirty-horse power. The new method is not, however, wholly a matter of improved apparatus. The chief factor in this gain that is made, consists in the mingling of a certain proportion of methylic spirits of pure wood alchohol with the water for the boiler. The proportion has been varied in different experiments, but the engineer of the Granite Company has derived results most satisfactory on the whole by using 10 per cent of the spirits. The gain comes from the element of alcohol. There is no special virtue in this particular kind of alcohol, and the ordinary alcohol of commerce would serve as well, and might be preferred if it were as cheap. The advantage is that the admixture of alcohol permits the water to be vaporized considerably lower degree of temperature, namely, at 106 degrees of Fahrenheit, instead of, in case of water simply, 212 degrees. The apparatus does not require any different boiler construction, but it is an outside attachment which may be adjusted to any boiler. By means of it the compound of water and alcohol may be used over and over again during a period of weeks, so that the cost for alcohol after the first layout is very slight. The apparatus consists mainly of a condenser in combination with a three-cylinder pump. One cylinder forces the exhaust steam into the coils of the condenser, and another carries outside of the coils a volume of salt water drawn directly from the dock alongside the engine-house. The third is the vacuum cylinder, which is of service in returning the condensed vapor to the boiler. This vacuum cylinder serves also in another way by relieving the direct internal pressure of the boiler, so that while under the former method pressure as indicated by the steam gauge, of sixty-five pounds was employed, forty-five pounds are now found to be sufficient. Another advantage appears in the use of the alcoholic combination, in the gain of time required for getting up steam, but about half the time formerly required being now needed. A series of practical tests of this invention—which has been patented here and abroad—is now for progress at the navy yard in Washington, and a report giving results measured with scientific accuracy, will probably appear at an early date. The inventor of this process is Mr. William L. Lowrey, of Boston. Mr. W. S. Chamberlain, formerly general agent of the Hartford Steam Boiler Insurance Company, is the manager, with an office at 66 State street in this city.—*Boston Transcript.*

Journal Friction.

A paper was read before the Am. Soc. of C. E. by Mr. A. M. Wellington, giving the details and results of experiments with a new apparatus upon the friction of car journals at low velocities. These experiments were undertaken to test the correctness of a series of tests described in a previous paper, which are made by starting cars from a state of rest down a known grade and deducing the resistance from the velocity required. The present experiments were made by an apparatus in which the axle to be tested is placed in an ordinary latbe having a great variety of speeds, the resistance of the axle being measured by the levers connected with a yoke encircling the axle and transmitting the pressures to a suitable weighing apparatus. It was found important that this weighing apparatus should be direct, as, for instance, a platform scale rather than a spring scale. The result of these experiments as to initial friction were that friction at very low journal speed is abnormally great and more nearly constant than any other element of friction. This abnormal increase of friction is due solely to the velocity of revolution. At velocities slightly greater, but still very slow, the friction is still large, the co-efficient failing very slowly and regularly as velocity is increased, but being constantly more and more effected by differences of lubrication, load and temperature. A very slight excess of initial friction would generally be observed. There is no such thing in journal friction as a friction of rest in distinction from a friction of motion. The fact that friction of rest appears to exist is solely due to the fact that no journal or other solid body can be instantly set into rapid motion by any force however great. At ordinary operating velocities the character and completeness of lubrication seems to be much more important than the kind of oil used, or even the pressure or temperature.

Comparisons were made of experiments by Prof. Thurston and by Mr. Power and the experiments of the author. The rolling friction proper in railroad service seems to be very small indeed, not exceeding one pound per ton. As to the resistance of freight trains in starting, it is believed that the resistance at the beginning of motion in each journal is about 20 pounds per ton. A velocity of from one-half to three miles an hour must be obtained before the journal friction falls to ten pounds per ton. At six miles per hour the journal friction is at least one pound per ton higher than at usual working speeds. Temperature exerts a very marked adverse influence upon friction at low velocities. The velocity of lowest journal friction is from ten to fifteen miles per hour. With bath or other very perfect lubrication, as with pad or syphon, greater velocity is apt to decrease as to increase the co-efficient. The latter being more like the ordinary lubrication in railroad service, we may say without sensible error that the co-efficient of journal friction is approximately constant for velocities of fifteen to fifty miles per hour.

SOLDERING ALUMINIUM.—The use of aluminium in the arts has been much restricted by our ignorance of any method of soldering it, either to itself or other metals. Now, however, a French engineer, M. Bourbouze, has discovered a way of effecting both classes of the operation with ease. The process consists in plating both surfaces to be soldered, not with pure tin, but alloys of tin and zinc, tin bismuth, and aluminium, etc. Good results are obtained with all such alloys, but those containing tin and aluminium are the best. They should contain different proportions, according to the work the soldered parts have to do. For parts to be fashioned after soldering, the alloy should be composed of 45 parts of tin and 10 of aluminium, as it is sufficiently malleable to resist the hammer. Pieces thus united can also be turned. Parts which have not to be worked after being soldered may be united with a softer solder of tin containing less aluminium. This last solder can be applied with a hot soldering-iron, as one solders white iron, or even with a flame. Neither of these solders requires any prior preparation of the pieces to be soldered. It suffices to apply the solder, and extend it by help of the iron over the parts to be joined. When, however, it is desired to solder certain metals with aluminium, it is best to plate the part of the metals to be soldered with pure tin. It is sufficient then to apply to the part the aluminium plated with alloy, and to finish the operation in the usual manner.—*Engineering.*

SUGGESTION IN THE MANUFACTURE OF RAILROAD IRON.—Some one has suggested an improvement in the manufacture of steel rails for railroad iron, by running it off when in the molten or plastic state, something as lead pipe is made. A cotemporary referring to the above says: Some of the operations connected with the manufacture and working of metals are of such a nature as to suggest the reasons for this man's view. Castings are made of any length by running liquid metal into a mold. Lead pipe is made by causing the metal to "flow" through a suitable die by the intense effort of a hydraulic press, some of the points of the flow being almost identical with those to be noted in the use of a liquid metal. Mr. Bessemer nearly a generation ago made an excellent quality of sheet metal by pouring liquid steel between revolving rolls, by which the metal, as it cooled, was delivered on the other side in a quite perfect sheet. Other similar continuously flowing processes could be named, so that it will be seen that the railroad manager may have reasons as closely in his thought upon the subject, as any man could from the note which he had made of what he supposed were similar things.

AN IMPROVED ANVIL.—C. Fisher, of Trenton, N. J., claims to have devised a new method of covering anvil faces with steel, by which the steel is more intimately connected to the body of cast metal. Heretofore, in making anvils of this class, the bottom steel plate was first placed in the mold and the horn steel plate was placed upon it, the two plates partially overlapping one another in such a manner that the metal, when poured in, did not enter between the overlapping ends of the steel plates, and thus an insecure and imperfect connection was formed. To avoid this difficulty the inventor does not place one steel plate upon the other, but leaves a narrow space between them in the mold. In this way the molten metal is enabled to enter between the steel plates and to form a perfect joint. The metal is prevented from running through the open space between the plates by a dam of metal or sand core or similar device.

MALLEABLE IRON COOKING POTS.—The manufacture of malleable iron cooking vessels by a local stove manufacturing company is promised. Quite a number of straight stove pots have been turned out already, and they are satisfactory in every respect. Unlike cast iron pots, those made of malleable iron are practically indestructible, as the severest blows delivered against them and test actions of heat show.

SCIENTIFIC PROGRESS.

Animal Remains in Coal.

Professor Miall, F.G.S., in a lecture on "Animals of the Coal Period," recently delivered at York, England, said that there were to be found associated with seams of coal, and especially with beds of shale even below coal seams, the flattened impressions of various creatures which once had life. There had been seen shells and other fossils, and the squeezed impressions of the bodies of crustaceans or insects. These remains were, however, extremely fragmentary, and were as black as the shale in which they were embedded; it was, therefore, a matter of considerable difficulty to put them together, in order to find out their original shape or to what sort of animal they belonged. But during the last 100 years, a number of naturalists had engaged themselves in this task, and had brought to light a variety of results. Naturalists, indeed, believed that our common pond mussel was represented by an ally in that very remote period. It was found that the fresh water animals of the coal period were very much more like recent animals than were the marine forms of the earlier times like those of the present day. Many of the common shells of Europe were represented in extremely remote antiquity. But marine shells and other productions of the sea were not mixed up with the beds in which had been discovered land shells and the remains of land animals. All the marine productions kept, as it were, to themselves, and they were found in special beds or layers; but the marine beds seemed to mark the time when some low barrier which kept the sea at a distance was suddenly broken down, and the water of the ocean made an incursion upon either a fresh water area or a land area, and left behind it some marine shells.

Fossil centipeds, such as might now be commonly seen in our gardens and fields, had been discovered in coal measures. Scorpions, too, had been traced by their fossil remains, and thus proved to be closely akin to the scorpion of our own day. Cockroaches resembling in all essential features those with which most of us are familiar, had been discovered in considerable numbers, and those of the present time formed, perhaps, one of the most ancient types of animal life now to be found upon our planet. Then there came the crayfish, which could be tolerably matched nowadays. But there had been animals which had disappeared from the earth altogether, without having left behind them any animal very similar to themselves.

Science in the Workshops.

The Seth Thomas Clock Company has undertaken, under the advice and guidance of Mr. L. Waldo, the construction of clocks of a high grade of excellence for scientific purposes, which they propose to call clocks of precision. They have already made considerable progress as to the best form of pendulum suspension, and dimensions of the steel-jar mercurial pendulum and, as soon as the small physical laboratory they are now building for this purpose is completed, they propose to investigate some of the questions which make good clock-making such a difficult art; such as, the permanency of length of pendulum-rods of various materials, the effect of air mechanically contained in the ordinary mercurial pendulums, the effect of mercuric oxide and other impurities of the mercury, and the effect of temperature changes on various forms of pendulum suspension. This is another instance of the tendency shown by American artisans to avail themselves of the most recent knowledge to be derived from scientific research.

Some time since, we noticed that the Pratt & Whitney Company of Hartford were spending many thousands of dollars in their efforts to produce screws and other measuring-engines, which would accurately correspond to the established yard and metre. In this work they availed themselves of the assistance of Professor Rogers of Cambridge; and the results they attained must be gratifying to every student of physical science interested in having accurate screws and gauges for use independently or in connection with other pieces of apparatus.—*Science.*

CHEAP ALUMINIUM. Referring once more to the subject of cheap aluminium, which somewhat over a year ago formed so general a topic of conversation, it may be of interest to recall the fact that Mr. William Frischmuth, a German chemist of Philadelphia, some time since secured basic patents in different countries for a process that now produces aluminium in a commercial way at a comparatively low price, with almost a certainty of being reduced to $1 25 per pound avoirdupois when worked in a large plant with proper technical and practical management, ample capital and perfected mechanical and chemical means. Instead of using metallic sodium he uses a vapor produced or generated in a suitable vessel from a mixture of carbonate of sodium or other suitable compound of sodium, and carbon or other reducing agent; and this sodium vapor, not metallic sodium, as used in the De Ville process, is made to react in various ways upon the aluminous materials to produce aluminium. Both De Ville and Frischmuth have to use the double chloride of aluminium and sodium, although Frischmuth has a patent for his successful use of the double fluoride of aluminium and sodium in making aluminium. This is another great item of cost in making this metal. But Frischmuth has made improvements in making the double chloride of aluminium and sodium, that reduces its cost to a few cents per pound, and consequently that of the metal. It has been tested in New York, London and Paris in a commercial way, and can be sold at the market price. All manufacture has been in the experimental and developing way, and Frischmuth is said to have sold metal thus made to the extent of many thousands of ounces.

PRACTICAL SCIENCE.—European naturalists regard the attention paid in this country to economic entomology, and the aid that has been given it by various States and by the general Government, as one sign of "a practical people." With all the specialization in instruction in the foreign universities, we are not aware that there is more than one which supports a professorship of entomology. This is Oxford, where the venerable Professor Westwood honors the Hope foundation. In this country Harvard and Cornell each have their full professorship of this science; and to the latter a summer school, having special reference to agricultural entomology, has now been attached. This seems more appropriate than many of the summer schools now so much in vogue, inasmuch as the objects of study are at this season in the light of their investigations into the power of crops to sustain insect life. To further the interests of the school, the trustees of Cornell University have relieved Professor Comstock of his duties during the winter *semester;* and an unusually good opportunity is thus afforded to teachers, as well as others, to familiarize themselves with the principles of this branch of economic science.—*Science.*

STEEL VS. IRON FOR TIN-PLATE.—The great reduction in the cost of steel is encouraging the use of that metal, instead of iron, in the manufacture of tin-plate. The advantage of mild steel over iron for such works must be obvious to everyone, and all new works now starting in England for that manufacture are working on steel plates. The American market in particular is calling for steel. There is but little, if any, difference in the price. Buyers of perishable food in tin cans are beginning to display much caution in the purchase of said goods, in regard to the character of the cans; and those canning firms will possess a decided advantage who can satisfy the market that the plates of which their cans are made are of an unimpeachable quality. It is said that poison from the taint of fish, in particular, affected by the presence of air after tinning, is not generally due to faulty soldering of the can, but to the inferior quality of the plates out of which the cans have been manufactured. There is much less danger of faulty steel plate tin than where iron plate is used.

A CURIOUS EXPERIMENT.—A Parisian, M. Treves, has made the following curious mechanical experiment. Two steel tuning-forks brought to the same pitch were topped with small mirrors, and placed opposite to each other in two vertical planes at right angles. One of them, No. 1, was, moreover, surrounded with a strong coil of wire receiving an electric current from a nitric acid pile, composed of four elements. A fiddlestick being now drawn across each of the tuning-forks, the vibrations commenced, and immediately a perfectly motionless luminous circle was produced in the mirror of No. 2. But no sooner was No. 1 magnetized by the admission of the current, than the circle became an ellipse, and swayed to and fro, denoting the action of a new vibratory motion. As soon as the current ceased, the figure became a fixed circle again. This experiment may serve to investigate the vibratory powers of iron and steel, according to their composition and physical state.

POSTURES IN SITTING.—M. Delaunay, of Paris, has been making extensive investigations upon the subject of postures in sitting as regards the extremities. He finds that the Chinese cross the left arm over the right, while Europeans cross the right over the left. Robust children cross the right over the left. Those who cannot work or are idiotic do the contrary. A great many women cross the left leg over the right. Among opera dancers some always cross the right leg over the left, but not one crosses the left over the right habitually. Infants under three years cross the left arm over the right, and when older reverse the position. Men generally cross the right leg over the left, and he cites statements of tailors that trousers are more worn on the left side, which bears most of the weight. The inference remains that the left brain develops before the right, but finally the right predominates.

A POLICE FORCE OF ANTS.—A queer way of employing ants is reported by an English gentleman who has been traveling through one of the provinces of China. It appears that in many parts of the province of Canton the orange trees are infested by worms, and to rid themselves of these pests the natives bring ants into the orangeries from the neighboring hills. The ants are trapped by holding the mouth of a lard bladder to their nests. They are then placed among the branches of the orange trees, where they form colonies, and bamboo rods are laid from tree to tree to enable the ants to move throughout the orangery.

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Passing Events.

The announcemeut of the defeat of the French in Tonquin by the Chinese has been the chief topic of conversation for a few days past. It is conceded that this war will be beneficial to San Francisco from a commercial point of view.

Just now we are in the midst of the season of fairs. The Mechanics' Fair in this city is drawing to a close after a successful exhibition. The fair at Sacramento will soon open, and then the Portland Mechanics' Fair will be inaugurated. The county agricultural fairs in this State are going on, and more are to come.

Mining news is somewhat quiet. Up at Coeur d'Alene work has been discontinued on the big ditch to bring in water to prominent claims; but, from what we could glean from the dispatch, this result is due more to lack of ready money to pay men than lack of faith in the claims.

THE Michigan copper mines no longer have the field exclusively. The Copper Queen and Old Dominion of Arizona are producing a good article of copper, for which ready sale is found in New York. The Colorado copper mines have for some years been contributing a fair quantity to the domestic supply. Montana has recently developed a copper mine that promises to eclipse all others. This is the Anaconda, and is largely owned by Haggin & Tevis of this city. This mine is already turning out large quantities, and shipments are being made direct to Swansea, at a profit of one-half cent over the best price that can be obtained in this country.

THE Alice mine, Montana, has declared another dividend, and the stockholders are happy. It is considered likely that the sinking of the main shaft will shortly be resumed from the 700-foot station, where it stopped four years ago. To accomplish this great work successfully, a Cornish pump has been ordered, which will be the only one in the Territory, with the exception of that on the Moulton, the sister bonanza of the Alice.

Mining Appliances at the Fair.

The display of mining appliances at the Mechanics' Institute Fair this year is not very large. There was a limited space in which to exhibit them. Moreover, much of the standard machinery has been placed on exhibition for San Francisco sight-seers before, and the manufacturers did not care to go to the expense this season. There are several articles, however, which attract attention.

Ore Mills and Breakers.

There are two ore mills in operatiou, one the Redstone patent and the other the Hill. The latter, which is called the "Triumph," we described and illustrated iu the PRESS a short time since. The machine has a capacity of from 12 to 15 tons of quartz per day with six horse-power. Mr. Hill is enabled to increase the crushing capacity of the machine by simply adding weight to the upper casting, which gives motion to the crushing rollers, which are V shaped. This mill attracts considerable attention, and is kept crushing quartz during the working hours.

The "Planet quartz mill," as Redstone's is called, has been on the market several years. He has a large and small mill on exhibition. The stamps are arranged in a circle, and strike every part of the dies at each revolution, and grind the entire circle. The cam moves backwards while the stamps are carried forward. The No. 1 mill weighs about 1,300 pounds.

The Radovich rock breaker is a comparatively new bidder for popular favor. It has a new mechanism for imparting motion to the jaws of the breaker. The jaws are arranged so as to be set close, for crushing quartz very fine, and the adjusting mechanism is of a new form. It is claimed to be a rock breaker and pulverizer in one. Mr. Radovich, makes, too, a prospecting breaker and assayer's pulverizer, which is exhibited also. It is of the same form as the large one, and will reduce ore to a fine pulp. It is made to work by hand or steam. It can be packed on a mule, being small and light, though strong.

Concentrator and Ore Feeder.

The only ore concentrator on exhibition is a new one, invented by L. Radovich. It is called the "Horse-shoe and Pan Concentrator." This concentrator is, as its name indicates, constructed in the form of a horse-shoe, with copper pan in center. The concentrator is wholly lined with copper, and it works on a new principle, different from any other concentrator now in use. It has no tranks, cog-wheels, joints or pinions. Its motion is intended to imitate that of the miner's pan, washing out gold. The machine is quite simple in appearance, and can be adjusted to different grades of sulphurets, free gold and other metals. They can be used like a rocker for saving fine gold in gravel or black sand, as well as in ores containing sulphurets. The inventor says it acts as a good amalgamator also.

The only ore feeder on exhibition is the Challenge, exhibited by the Joshua Hendy Machine Works. There is a standard machine well known wherever there are quartz mills, and of recognized effectiveness. The same may be said of the nozzle for hydraulic mining exhibited by the same firm.

Rock Drills and Pumps.

Mr. E. A. Rix has in operation one of the large National air-compressors, and also the Pacific rock drill. In this latter Mr. Rix has applied a mechanism of his own invention, which largely reduces the amount of air necessary to drive the drill. It can be applied to drills of the various types, and economizes their operation. The invention is a highly important one, and one we shall shortly give a more detailed description.

Mr. Dow exhibits among the pumps in his display a special sinking pump for mines, which has some new features. We shall also give a more complete description of this in a short time.

Silver-plated Amalgamating Plates.

Among the mining appliances on exhibition is a large silver-plated amalgamating plate, made in this city by E. G. Denniston. It is five feet by eight—40 square feet—the largest ever made in the world, though the works are fitted to make one eight by twelve feet, or 96 square feet.

The constantly increasing demand for these plates has created an important industry on the Pacific coast. Nothing has yet been found or invented, or probably ever will be, to take the place of these plates in saving gold. The great affinity existing between silver, copper and quicksilver forming an electric and chemical action to attract and save gold, cannot be supplied by any other process. These plates were first manufactured here, about sixteen years ago by E. G. Denniston, proprietor of the San Francisco Plating Works, 653 and 655 Mission street. Since then the demand has constantly increased. His works are the most extensive in the United States, in fact in the world, for this class of work. The reputation of his silver-plated amalgamating plates is world-wide, the manufacturer having sent them to every known mining country. Almost every quartz mill on the Pacific coast is using his plates with great success. A large number are in use in the Rocky Mountain mining States. To meet that trade he has an agency in Denver, Colorado, the Hendrie & Bolthoff Manufacturing Company, extensive manufacturers of mill and mining machinery.

Mr. Denniston has been very busy lately filling some large orders; but just now, is engaged on the largest order ever received, consisting of 1,500 square feet of silver-plated amalgamating plates for Alaska, amounting to about $5,000.

The extensive facilities, and first-class reputation of his amalgamating plates, has enabled him to secure this order from other competitors. The San Francisco Plating Works, has all the latest improvements, known to the business. The plating is done by a large Mather Dynamo Electric Machine. Every description of metal goods is plated here, with gold, silver, nickel, platina, bronze, etc. and finished in the highest style of the art. Visitors who care to see it will at any time be shown the interesting process of depositing metals by electricity.

Roasting Lead Ores.

By roasting an ore we wish to expel its sulphur, arsenic or antimony, and convert the metals in it into oxides, in which form they are best adapted either to be carried into the slag or into the metallic state during subsequent smelting. The roasting is carried out by exposing the ore to the action of heat and air, in consequence of which sulphur, arsenic and antimony are volatilized as sulphurous, arsenious and antimonious anhydrides, respectively, while the metals remain in the oxidized state. According to the apparatus in which the operation is performed, the result will be more or less complete. The roasting of arsenical and antimonial ores is rendered more difficult by the simultaneous formation of arsenic and antimonic acids, which combine with the metal to form arseniates and antimoniates. These compounds can only be decomposed by repeated additions of carbon and access of air, whereby the arsenic and antimoniac acids are reduced to their arsenious and antimonious anhydrides, and thus gradually volatilized.

Ores containing sulphide of zinc (zinchloride, spahlerite), are also difficult to desulphurize by roasting, inasmuch as zincic sulphate is always forming, which is only decomposed in a white heat. Mr. Stetefeldt found that sulphate of zinc is the most constant compound in the fire next to sulphate of manganese. While during the first two hours of roasting nearly all the sulphate of iron had been decomposed, there was still a large percentage of zincic sulphate undecomposed at the ninth hour. The behavior of zinc makes zinciferous ores hard to work. In the blast furnace any sulphate of zinc remaining undecomposed after roasting will be reduced again to sulphide. The substance goes partially into the matte, if any is forming, partially into the slag, which makes it thick and stiff. It also carries silver along, and thus gives rise to losses above and beyond those inherent to all metallurgical processes.

TWENTY years ago the price of bar copper in New York was 55c per pound. To-day 14c is the outside asking price, and last week there were sales of Lake copper at 13½c, equally good Arizona copper at 13¼c, and Colorado copper smelted at Taunton, Mass., at 12½c. These prices show a decline of 75 per cent in this article in the last two decades. The rates at present are the lowest ever known in the trade in this country. There is still a duty of 4c per pound on ingot copper, but it has failed to stem the downward tendency. The local product has been increased much more rapidly than the home demand.

Date of Location and Mining Surveys.

A case has recently been brought before the Secretary of the Interior on appeal from a decision by the Commissioner of the General Land Office, which involves the question as to whether the date of location shall be indicated on the approved plats of survey or not. The Ohio and Queen of the Hills lodes, in Uintah district, Utah, came in conflict. On October 25, 1882, the Queen of the Hills made application for survey, and on the 30th of the same month the Ohio did the same. On January 10, 1883, the Ohio filed application for purchase; on the 26th of the same month the Queen of the Hills applied for purchase, and the Register denied the application on the ground of conflict with the Ohio. The Land Office held the Ohio lode entry for cancellation, upon the ground that the Queen of the Hills application, having been regular, was an appropriation of the land, and that the Register and Receiver's action in allowing the Ohio lode application and entry was "wholly unauthorized, and contrary to law and the uniform practice of this office."

It appears that, although the Queen of the Hills application was filed prior to that of the Ohio lode, the location and survey of the latter claim nevertheless antedated the location and survey of the former. Such state of facts would seem to account for the further fact that the official plat of survey of the Queen of the Hills showed the existence of a conflict with the Ohio lode, while such plat of the latter showed none. The Register and Receiver allowed the application for the former claim, because none had been made or filed for the latter, and they allowed the application for the latter because the official plat of the survey thereof "*showed no conflict of any kind.*"

The Secretary of the Interior decides that in this they erred. They should instead have treated the junior application as an adverse claim, since the conflict in question had been shown to exist by the record of the senior application, and thereupon stayed all proceedings, except the publication of the Queen of the Hills' notice of application, until the controversy had been settled by a court of competent jurisdiction, or the adverse claim waived. It was competent for the Ohio lode claimants to adverse the Queen of the Hills lode, but they were misled by the Register and Receiver's erroneous action, in allowing their application and failing to stay proceedings. It was not competent for the Register and Receiver to allow the junior application. Such procedure having been manifestly erroneous, should be corrected in so far as the department has power to afford the opportunity, and to this end the parties should be remitted to a court of competent jurisdiction. The Secretary instructs the Land Office in future to require Surveyors General to indicate the date of location on the approved plats of survey.

The Oregon Mechanics' Fair.

The sixth annual exposition of the Portland Mechanics' Fair, Portland, Oregon, will open October 9th and close Oct. 25th. This is an annual exhibition similar to the Mechanics' Fair in San Francisco. The prospects are that the forthcoming fair in Portland will be the most successful ever held. E. W. Allen, Esq., the genial Superintendent, has recently visited the Mechanics' Fair in San Francisco, and he reports that, in addition to the interest which is felt at home in the Portland enterprise, several of the present exhibitors at San Francisco will make a display of their wares or machinery at the Portland exposition. This is as it should be. Mr. Allen speaks highly of the courtesies extended to him by the officers of the Mechanics' Institute, especially by Messrs. Cornwall, Gilmore and Culver, and he believes he left for home freighted with many ideas that will contribute to the success of the enterprise which he has in hand. The Portland Association owns an exposition building, and its interests each year are placed in the hands of a board of managers selected from among the most enterprising business men of the city. The following are the present officers: President, J. B. Congle; Vice-president, Jas. Lotan; Secretary, Gustaf Wilson; Treasurer, Wm. M. Ladd; Superintendent, E. W. Allen.

SIX Michigan copper claims have this year paid $1,315,000 in dividends, against $2,670,000 for the whole of 1883, while from the start these claims have paid $32,390,000 to date.

Iron and Concrete Construction.

(Read before the Technical Society of the Pacific Coast by P. H. Jackson.)

Several experiments were made in London, in 1876, by Mr. Thaddeus Hyatt, assisted by Mr. Thomas Kirkaldy, author of the text book entitled "Experiments on Wrought-iron and Steel," on Mr. Hyatt's invention of combining wrought-iron bars as tie metal, and so prepared as to prevent any slipping when placed into and near the bottom (the weak part) of a Portland cement concrete beam in which they were enclosed and became united to it.

The first application of the tie metal is capable of furnishing all the tensile strength needed but with a straight beam the tie must be qualified to resist cross-strain equally well at any part, the tie must of necessity be attached to the web practically throughout its entire length as firmly at one point as at another.

The object of such fastenings not being to prevent the tie from bursting away from the web in a downward direction because of such tendency, but to counteract the tendency of the shearing stress.

This discovery of the true relations existing between

A Tie and its Web,

Also demonstrating the sufficiency of the cohesive power of the web itself to hold the tie in connection to the top of the beam, whether such web is concrete or metal, is due to the difference of the thickness necessary for this purpose.

Where the web is of concrete instead of metal, being proportionate to the difference between the cohesive strength or power of metal and concrete.

It is important to make use of ties having the greatest friction surface for side adhesion, hence flat, thin ties with projections are preferable, but the invention comprises other shapes where the surface is roughened, or may be crimped, corrugated, indented, or with pins, bosses, or projections of any kind.

There is not that tendency to buckle or lateral inclination when under strain with a concrete beam as in that of an iron one, due to the thickness of the web.

The arrangement of the blades or ties as shown in the gridiron from plate 32, and others being the most effective and simple.

The Application of the Ties to the Concrete Body.

In the application of these ties to a Portland cement concrete body what action are the different parts subjected to when employed? The upper portion of a concrete body resists compression, of which Portland cement is known to possess this property to a great degree compared to its property to resist separation. General Gilmore says, the proportion at the age of 9 months is 14 of resistance to compression, to 1 of resistance to extension, while cast iron is but 6½ to one of tension.

In General Gilmore's work, entitled "Coignet Beton and other Artificial Stone," on page 34, is as follows:

The strength of English Portland cement to resist compression from trials made of a block 9

When a Beam or Slab

Of this, or any other material of like nature, is loaded on its top surface, the upper part being in compression, is greatest at the top surface, and diminishes gradually until it ceases about midway of its depth, or wherever the neutral axis may be; and from there extension or tent dency to separate the parts begins in the leas and increases gradually until the bottom sur-

Fig. 1.

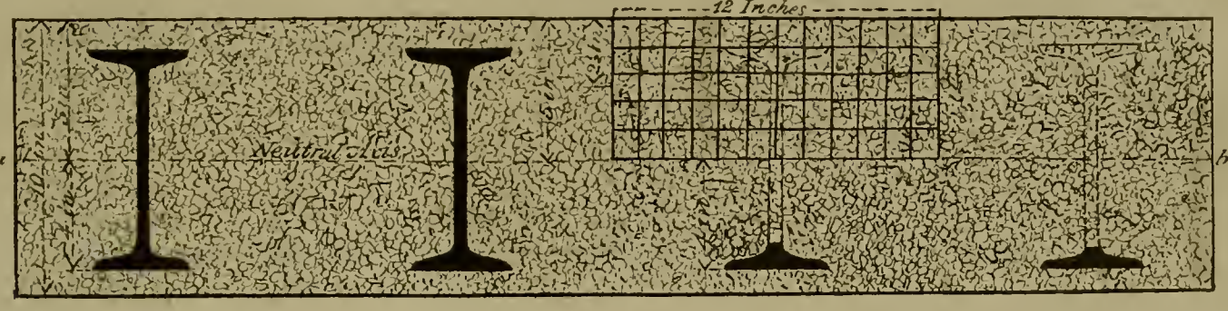


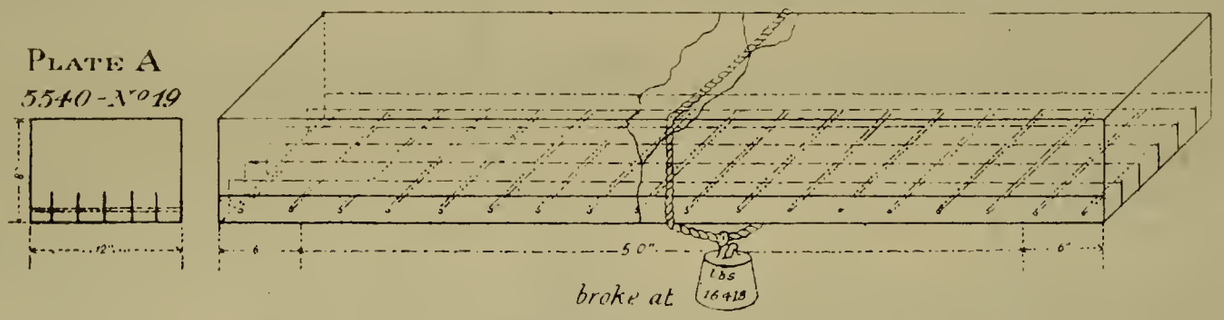
FIG. 1. SECTION OF PORTLAND CEMENT CONCRETE FLOOR WITH WROUGHT IRON BEAMS

face is reached, which is the greatest.

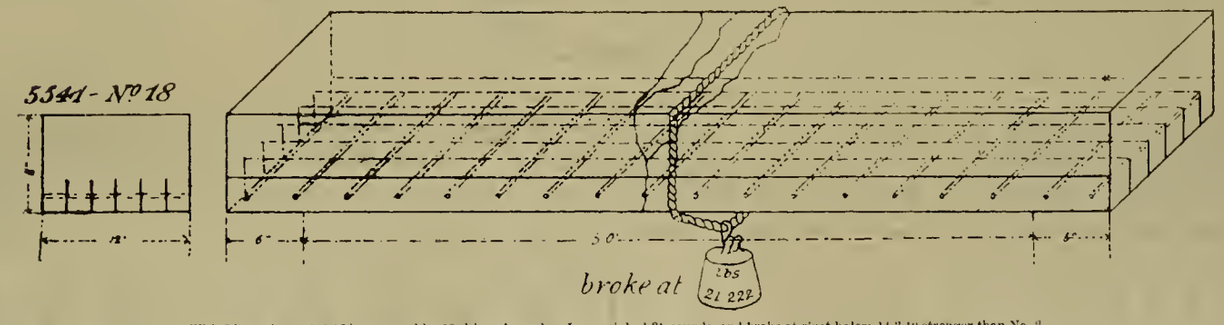
These iron ties with projections close together, or roughened surfaces extend the length of the tie, and for holding to the cement and side adhesion to the body of the tie, are placed as near to the bottom of the cement or concrete body as practicable, so as to be firmly held there.

It is intended to have that part of the con-

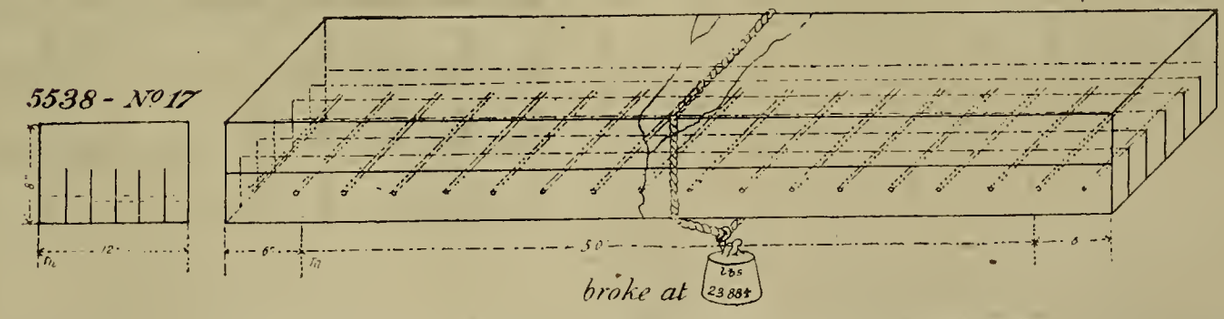
PLATE A



With 7 iron plates, 2x1-16 in., crossed by 18 ¼ in. wire rods. Iron weighed 21 pounds, and broke at rivet holes; 11½ times stronger than No. 2.



With 7 iron plates, 3x1-16 in., crossed by 18 ¼ in. wire rods. Iron weighed 31 pounds, and broke at rivet holes; 14 3-10 stronger than No. 2.



With 7 iron plates, 4x1-16 in., crossed by 18 ¼ in. wire rods. Iron weighed 41 pounds, and broke at rivet holes; 16 times stronger than No. 2.

to balance the compressive resistance of the other material, so that all metal may be dispensed with but the tie only, and that hard baked bricks and cement possess in themselves cohesive power and strength sufficient to perform the functions ordinarily performed by a metallic web.

The improvement consists in so preparing or making the iron ties with bosses or raised portions formed upon the surface of common bar or hoop iron roughened or studded with pins, or several blades threaded on wires, the binding power of the cement holding them firmly in position, preventing the possibility of any slipping or sliding of the material one over the other when the beams or structure is under strain.

For Resisting the Thrust

Of a bow string girder or arch, a tie may be made dependent on the two end fasteuings only; months old was 5,973 pounds per square inch. With one volume of sand, same age 2,631 pounds per square inch, and on pages 53 and 54 is as follows:

It is known that the strength of Portland cement mortars does not reach its maximum limit within a period of two, or perhaps three years.

Neat cement in blocks of the size of an ordinary brick, at the age of nine months, the compressive to its tensile strength becomes in the ratio of fourteen to one. With a mixture of one of cement and two of sand, the ratio will be found between the limits of fourteen to one and nineteen to one. This exhibits the tensile weakness of Portland cement, compared to its great resistance to crushing, and by the application of the ties in the manner employed by Mr. Hyatt renders the feeble part equal to its strong compressive property.

crete body to resist compression fully up to, and may be in excess of, the tensile strength of the iron ties, as the formulated calculation is based on the tensile strength of the ties.

We have by this combination a cheap and simple method of utilizing the strength of a Portland cement concrete body, compressively considered, without its weak tensile resistance entering into the calculation.

The formula for computing its strength, providing the ties are kept at a proper distance below the neutral axis, is as that for computing the strength of a made-up wrought iron beam or girder; that is, after the top and bottom sections, each way from the neutral axis, are adjusted in their respective resistances.

Mr. Wyatt's disquisition of the results of his experiments with this construction is set forth, entitled "An account of Experiments with Portland Cement Concrete Combined with Iron

as a Building Material," of which the following is an extract:

Fig. 1 represents a section of a

Portland Cement Concrete Floor,

With rolled wrought iron beams built in it. When employed, what function do the several parts perform? The top surface resists the greatest compressive force, which gradually diminishes downward until the neutral axis, *a b*, is reached, where it ceases to exist. From there commences the minimum of tensile strain, which increases until the bottom surface is reached, which is the maximum of the tensile strain. Referring to Fig. 1, what sustaining function does the concrete flooring with the integral parts thereof perform? The parts of iron beams above the neutral axis, *a b*, are worthless, and a consequent useless expense, as their resistance at that place to compression is not brought into action; the Portland cement concrete unassisted, as will be shown, has a greater power of that resistance than the case requires. To the right, in Fig. 1, the part laid off in square inches from the neutral axis *a b* to the top surface is 5 inches, and a width of 12 inches, making an area of sixty inches.

If we take the compressive resistance of Portland cement concrete at 200 pounds per square inch (in General Gilmore's experiment nine months old one of cement and two of sand crushed at 3,631 pounds per square inch), we get a mean of 1,000 pounds acting two and a half inches, or half way between the neutral axis and top surface; therefore we have 60 square inches of 1,000 compressive pounds to the inch, equalling 60,000 pounds acting on the end of a lever two and a half inches from the fulcrum. The neutral axis, *a b*, $60 \times 2\frac{1}{2} \times 1{,}000 = 150{,}000$ pounds to resist compression and to balance tension below the neutral axis.

This is without that part of the iron beam above the neutral axis doing any duty.

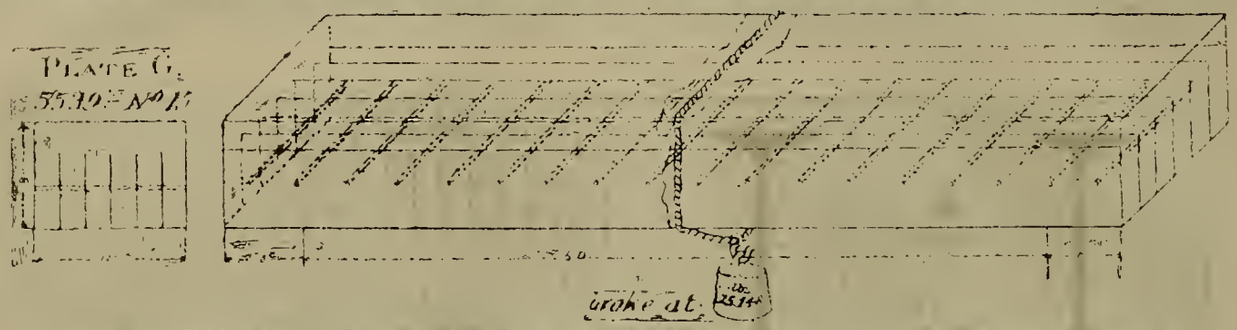
Then if we take the metal *D* (the bottom flange of the beam only, the shaded part) held in the concrete in the manner described, at 2 inches wide and one quarter of an inch thick, equal $2 \times \frac{1}{4} = \frac{1}{2}$ inch square of iron, and assuming the tensile resistance of wrought iron at 25 gross tons or 56,000 pounds per square inch, then the half inch tie represents 28,000 pounds, multiplied by the leverage of four inches down from the neutral axis which is the fulcrum to both, we have 28,000 pounds multiplied by 4 inches leverage equals 112,000 pounds.

The compressive surface of the concrete, 150,000 pounds, is therefore in excess of the demands of the tie metal, and the top flange and web of the iron beam are useless and only the bottom flange is employed. Therefore about three-quarters of the beam is of no avail.

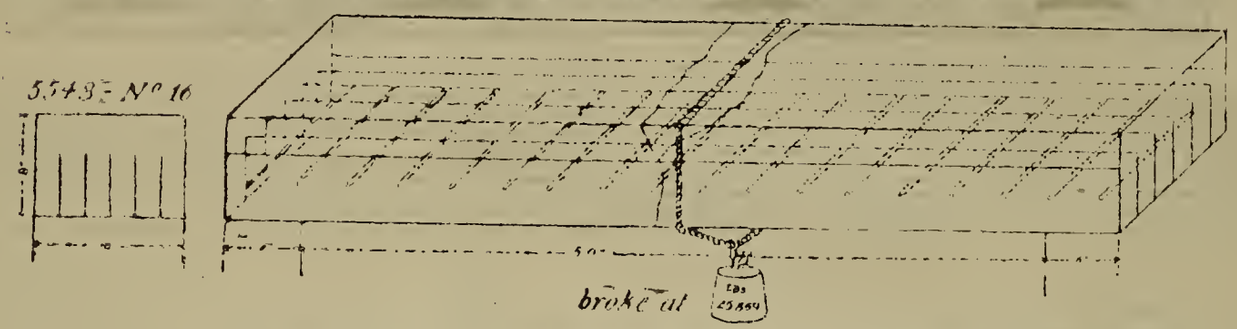
Many have questioned the possibility of uniting metal to concrete as a bottom flange is held to its web in a rolled or riveted beam, and as to whether when under strain the two materials will act in concert.

The answers to these queries is by reference to plates *A* and *G*, Nos. 15, 16, 17, 18 and 19, as being five examples in thirty-one experiments. Several trials were made without projections on the ties, and in every case pulled through the concrete.

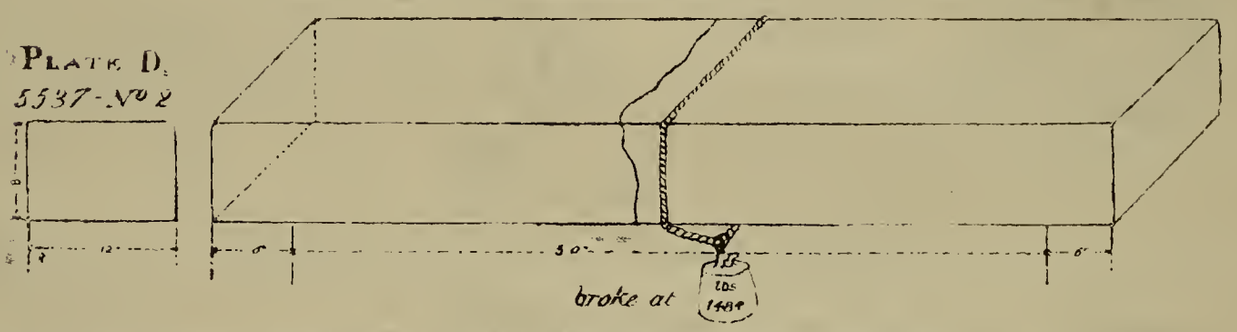
A study of them shows from the breaking of the metal: Firstly, that all the blades of the iron were perfectly held in the concrete body while the beam was under strain. Secondly, that in both cases the two materials worked in perfect harmony. Thirdly, that the proportionate power of the metal increased regularly as it became tie metal.



With 7 iron plates, 6x1-16 in., crossed by 18 ¼ in. wire rods. Iron weighed 62 pounds, and broke at rivet holes; 17 times stronger than No. 2.



With 7 iron plates, 5x1-16 in., crossed by 18 ¼ in. wire rods. Iron weighed 52 pounds, and broke at rivet holes; 17.4 stronger than No. 2.



Concrete only, composed of two parts of crushed stock bricks and one of cement, broke at only 1,484 pounds.

The 2x1-16 inch blades of beam, No. 19, exhibited a greater tensile power in proportion to cross section than 5,543, No. 16, where the blades were five inches in depth; the higher the blades, the more they loose as a tie, as the strain proportionately diminishes the nearer the tie metal is to the neutral axis. Therefore, the ties in all cases must be a proportionate distance below the neutral axis.

When a beam of any kind is subjected to a bending stress, it becomes more or less curved by virtue of which the lower portion is lengthened, and the upper portion shortened, in proportion to the depth of the beam or the difference of length between the radii of the curves.

Were the beams made up of horizontal layers the effect of the stress would be to cause these to slide one upon another, but the beam being solid the particles are held together by their own cohesion, the shearing strains being thus opposed by cohesive force.

The primary strains in the beam or the lines of compression and extension being upon curved lines the disturbed particles must of necessity tend to arrange themselves in harmony with the radial lines of circles, all below the neutral

(*Concluded on page 141*).

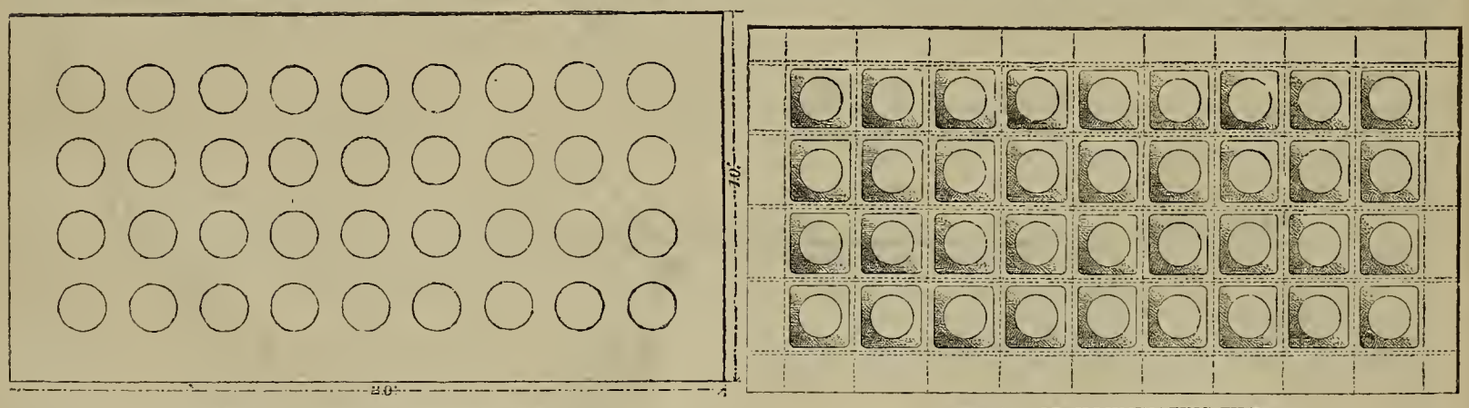
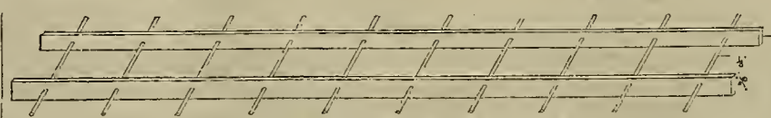
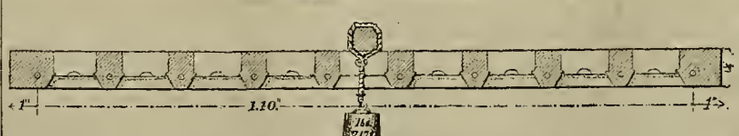


Fig. 1.—TOP OF ILLUMINATING TILE. BOTTOM OF ILLUMINATING TILE.



IRON TIES ON ILLUMINATING TILE.



CROSS SECTION OF ILLUMINATING TILE.

The Strike at Bodie.

The report being circulated last evening that two more strikes had been made in the New Standard, and that hereafter all visitors would be excluded, the *Free Press* reportor took occasion to call at the mine, and made a hurried examination of the new developments.

It was found in the advancement of every foot since the last visit that the ledges showed stronger and richer, while some of them are rapidly widening out. The succession of stringers in the tunnel, as mentioned in last report, proves to be an immense body of vein matter, all of which can be worked to advantage. This comprises what the boys call the "bonanza ledge," and as depth is attained will prove something extraordinary. No. 3 ledge shows much richer in gold, while it still carries a large percentage of silver. It is from 3½ to 4 feet in width, and will assay high up into the hundreds.

Just before reaching the face of the tunnel a "horse" was encountered, and passing through it quartz stringers again come in, and in the face blue or greenish quartz similar to No. 3 appears, showing the close proximity of another important ore-body.

Shaft No. 4 was the particular object of inspection. It has been sunk to a depth of about 70 feet all the way on the ledge. At the bottom a strike was made, the peculiarity of which differs from any other formation in this district. The eastern foot-wall is plainly defined, and next to it is a large stratum of soft white quartz, carrying lots of gold and is very similar to that of the Bodie Con., but the opposite wall is not in view as proved by picking to be all quartz. In the face of the drift is shown porphyry, clay and ore, every particle of which is heavily charged with gold. One quartz vein running from overhead to the bottom and several inches in width, literally sparkles with gold, and will go from $12,000 to $60,000 per ton. A bucket of rock from this shaft dumped into a ton of the lowest grade would make an average of $40 or $50 per ton.

The peculiarity spoken of is noted in all of the gold belts wherein the precious metal appears from wall to wall mixed in porphyry, clay and quartz. A specimen of porphyry lies on our table which shows coarse and fine gold in quantities seldom ever seen even in pure quartz. It is a study and a curiosity, like also the formation, for any scientist or miner. The boys now have about 94 feet of ledge matter that would all mill with profit. A large quantity of ore is extracted and negotiations are pending for the purchase of the Miners' Mill. The working of a few tons will put the owners in circumstances and enable them to further develop what now bids fair to become the biggest and richest mine ever worked in Bodie.—*Bodie Free Press.*

Oil on the Waters.

Gunner Cushman, who started north in the *Onualaska* with Lieutenant Stoney to explore the river in Alaska discovered last year by the latter officer, has been obliged to return to this city on account of ill health. The schooner reached the northern latitudes after many struggles. Before reaching Onualaska the schooner rode out two very severe gales, described by those on board as the most severe they had ever known in their sea-faring experience. In the first, when the gale struck the little vessel it threw her on her side, with the galley under water. Only by letting everything go was she righted again. For a few moments those on the schooner believed that their last hour had come. However, they succeeded in laying-to under close reefed foresail, and remained in that condition eleven days before it was safe to proceed on their way. When the vessel was first thrown over on her side, great seas swept clear over her.

When the skies indicated the approach of another gale, preparations were at once made for it. The vessel lay-to under close reefed foresail, but when the gale struck her it proved even more severe than the first one. For a while the vessel lay quite comfortable, but as the wind and rain increased, the position of the vessel became perilous in the extreme. Every minute it was feared that the sail would be blown out of the bolt rope and great combers threatened to sweep the vessel's deck. In this emergency Lieutenant Stoney decided to try the effect of a drag and of oil. He had had a drag made some time before, expecting to find use for it. It consisted of a triangular sail, to the lower corner of which a ninety-two pound anchor was attached, while the upper edge was secured to a spar. A four-inch hawser was attached to the spar. Attached to the spar, also, was a receptacle for holding oil and so constructed that the oil would be forced out by the waves themselves. The apparatus was then thrown overboard and the vessel so maneuvered that the drag stood off the weather bow.

The result was most satisfactory and surpassed the expectations of those on board. The immense waves were reduced so much in size and came so quietly that the vessel rode smoothly. All the waves were affected, but the great foaming combers more than any other. So great was the force of the storm that the four-inch hawser parted, and the vessel was again obliged to depend on her sail. The force of the gale, having, however, been broken, it was no longer a difficult matter to lay-to.

USEFUL INFORMATION.

To Stain Bone and Ivory.

The following most approved methods for this purpose, we copy from *The Manufacturer and Builder*:

For a Red Stain.—Boil shavings of scarlet cloth in water, adding by degrees pearlash until the color is extracted. The color may then be cleared with a little alum, and the liquor strained through a linen cloth. Steep the ivory or bone in dilute aquafortis (1 acid to 2 water); then remove and steep in the scarlet dye until the color is satisfactory. The aquafortis should not be too strong, and the articles should not remain in it too long. The safest plan is to make a preliminary trial with a strip of ivory, and as soon as the acid is observed to cause a trifling roughness of the surface, it should be removed and placed in the dye liquor, which should be kept warm, but not too hot. A little practice, with these precautions, will enable one to produce any desired shade of coloration. If it be desired to have any parts of the bone or ivory uncolored, it will be necessary to cover such parts with wax or paraffin, through which the stain will not penetrate. For Black Stain.—Dissolve nitrate of silver in three times its bulk of water, and steep the bone or ivory in it for about an hour; then remove and expose to sunlight, when the piece will quickly assume an intense black. For Green Stain.—Steep the work in a solution of verdigris and sal-ammoniac or weak aquafortis, in the proportion of two parts of the former to one of the latter. The aquafortis should have the same strength as that indicated in the receipt for red, and the period of immersion should be gauged carefully. For Blue Stain.—The work should be stained green as just indicated, and then dipped into a strong solution of pearlash in water. For Yellow Stain.—Place the work in a solution of alum in water, and keep boiling for some time; then remove and immerse in a hot infusion of tumeric in water. Let the work remain simmering in this infusion for about half an hour, and the yellow stain will be finely developed. In all these operations it should be observed that bone or ivory should dry very gradually, or it will crack or split.

To Avoid the Shrinkage of Wool.—It is very doubtful if any practicable method of washing woolen goods so they will not shrink can be devised, says the *Manufacturer and Builder*. "The structure of the individual fibers of the wool is such that they have a tendency to mat together when wetted, and especially when friction is applied to them in this condition. This is due to the fact that the wool is supplied with barbs or hooks, by means of which adjacent fibers readily attach themselves to each other, and by the existence of which the operation known as "felting," is made possible. Nevertheless, Dr. Tillman affirms the following plan avoids the shrinkage of woolen articles, and we give his procedure for what it is worth: The garments are to be soaked for several hours in a warm, moderately concentrated solution of soda, to which half a tumblerful of ammonia water has been added, more or less, according to the quantity of clothing. They are then to be washed out after the addition of some warm water, and rinsed in fresh water. The same result will follow, according to this authority, by adding a tumblerful of ammonia to a small tub of water, soaking the articles in this for half an hour, and then rinsing them in pure water. In the above, it will be observed, rubbing or friction is avoided, and reliance placed on the clensing action of strong alkali for the removal of grease or dirt. This is probably the explanation of any virtue the method may have."

Wire Rope and Hemp Rope.—Wire rope of the same strength as new hemp rope will run on the same sized sheaves; but the greater the diameter of the sheaves, the longer it will wear. Short bends should be avoided, and the wear increases with the speed. The adhesion is the same as that of hemp rope. Wire rope should not be coiled or uncoiled like hemp rope, but should be wound upon a reel. When substituting wire rope for hemp rope, it is well to allow for the former the same weight per foot which experience has approved of for the latter. As a general rule, one wire rope will out-last three hemp ropes. To guard against rust, stationary rope should be oiled once a year with linseed oil, or kept well painted or tarred. Running rope, while in use, requires no protection. Where great pliability is required, the center or core of wire rope is made of hemp, and small sized rope is generally made with hemp centers. Running rope is made of fine wire, and standing rope of coarse wire. Wire rope made from charcoal-made iron is fully one-fourth stronger than the ordinary rope. The standing rigging of a vessel, when composed of wire rope, is one-fourth less in weight than when of hemp.

Chimneys in Olden Time.—In the year 1200 chimneys were scarcely known in England. One only was allowed in a religious house, one in a manor house and one in a great hall of a castle or lord's house, but in other houses the smoke found its way out as it could. The writers of the fourteenth century seemed to have considered them as the newest invention of luxury. In Henry the Eighth's reign the University of Oxford had no fire allowed, for it is mentioned that after the students had supped, having no fire in winter, they were obliged to take a good run for half an hour to get heat in their feet before they retired for the night. Hollinshead, in the reign of Elizabeth, describes the rudeness of the preceding generation in the arts of life. "There were," says he, "very few chimneys; even in capital towns the fire was laid to the wall and the smoke issued out at the door, roof or window. The houses were wattled and plastered over with clay, and all the furniture and utensils were of wood." In 1589 a tax of two shillings was laid on chimneys.

Milk vs. Ink.—"Not every one knows," says a daily paper, "that if ink is spilled on a carpet or a woolen article it can be removed without leaving a trace. This is very easily done if the ink is attended to while still wet. Take clean blotting-paper or cotton batting, and gently sop up all the ink that has not soaked in. Then pour a little sweet milk on the spot, and soak it up from the carpet with fresh cotton batting. It will need to be renewed two or three times, fresh milk and cotton being used each time, and the spot will disappear. Then wash the spot with clean soap suds, and rub dry with a clean cloth. If the ink has been allowed to dry, the milk must remain longer and be repeated many times, but, with perseverance, every particle of the offending liquid can be made to disappear."

An Electrical Need. "We want," says Edison, "to get electricity from coal direct, without the intervention of boiler and engine. A good many people are at work on it. We don't see our way at all to it, but I will say it is surely possible. Zinc and other metals we can get into electricity at once, but the trouble is to do it with coal and carbon. If we could, we would get six horse power from one pound of coal, while with the boiler and steam engine we get only one-horse power from three pounds of coal."

Hay water is a great sweetener of tin, wooden and iron ware. In Irish dairies everything used for milk is scalded with hay water. Boil a handful of hay in water, and put in the vessel when hot.

GOOD HEALTH.

[Translated for the PRESS from the German by CHAS. TROPPMAN.]

Cholera.

This dreadful and death-striking disease hails from the hot climate of the Orient. Its reappearance in Europe has been oftener than that of the pest, and through that medical science has come nearer to solve the problems of its origin, contagency and its cure. It has been discovered that its contagency is due, and only due, to the stools of the afflicted, and that through social intercourse with the afflicted it may never be caught. Wherever the stools of cholera patients undergo further decomposition, the germs of the disease will be taken up by the air.

Therefore we infer that an epidemic must appear whenever the excrements from cholera patients, whether it be at their hight or at their beginning, are emptied into closets which are visited by perfectly healthy persons.

Of course, improper sewerage, dampness, bad water and food, filthy ways of living in general, assisted by bad closets, may bring it about, and generally amongst the most thickly settled parts of a town, where the poorer classes so generally live in a filthy and unhealthy condition. None are excepted, young or old, male or female; but it is certain that these people whose stomach and bowels are sometimes afflicted by some trouble or another, are more apt to be taken down by cholera than others. Diet is a great item in this disease, it having been noticed that on Monday—since Sunday gives occasion to excesses—always more cases were reported than on other days. The period of its appearance from its inoculation may be from one to three days; although cases are known where six days had elapsed since the poisonous germs had been inoculated. One particular case has been noted in the epidemic at Vienna in 1870. A young lady working as a collector in a coffee saloon, who on her day off visited her mother, which happened once a week, her mother living in a part of the city where cholera was raging. Five days after her visit she was taken down, and on the sixth was dead. She was perfectly well on the evening of the fifth day, and had no symptoms of cholera; but after closing the store, the powerful poisons made themselves felt.

We have three forms of cholera. The lightest form consists of a watery discharge from the bowels; but even such stools produce the poisonous germs of cholera, and bring about the epidemic, and sometimes in its severest form.

The second and more deadly form, emesis, is united with the watery stools. In this form the stools already have the appearance peculiar to cholera, they having a yellow color, and no more odor, and look like rice-water. These rice-water stools are a characteristic sign of cholera. Through the continuous emptying of the bowels a large amount of water is taken from the system, and a terrible thirst will appear.

In the third form, the most deadly of all, another symptom is added to these already mentioned, namely, the cramp-like contraction of some of the muscles, generally the muscles of the shaft. This third form is generally the result of either the first or second form, which had continued for some days, through which it seems the whole contents of the bowels are emptied; but whenever the patient is required to take to a vessel, he is always surprised that it is filled, when he leaves it. But most patients do not know in what danger they are, and are careless enough not to ask for medical assistance, though before they had always asked for it, when but slight cramps troubled them. The passage of the bowels repeats itself quickly in succession, the discharged masses being large and thin, and soon look like the rice water discharge. After the second or third passage, many of the afflicted are overtaken by extreme weakness, or even faint, so that they cannot reach their bed from the vessel without assistance. At the same time a powerful contraction of the shaft muscles, and a terrible thirst sets in, which increases after each passage, the result being, the more they drink the sooner vomiting will set in. The weakness of the patient increases rapidly, and his voice becomes soundless—cholera voice, the passages continuing to pass off, right along; the kidneys cease to fulfill their function; the powerful and painful shaft cramps become more severe, and repeat themselves oftener; the pressing thirst cannot be quieted, and in addition to all these frightful symptoms, the patient is overtaken by a peculiar feeling of fright and danger. Since this, his appearance has undergone a large change, his eyes are sunk down in their orbits, the nose becomes pointed, the cheeks have fallen in—cholera face. The skin on the hands becomes shriveled, like that of washer-women, the lips and the whole body has a blueish tint. The pulse is not felt in most cases an hour after the appearance of cholera; the circulation of the blood becomes more and more incomplete, and since less and less blood reaches the surface of the body, the temperature sinks, particularly on uncovered places, to that of a dead body. Patients seldom complain of headaches, oftener about black spots appearing before their eyes, noise in their ears and faintness. The patient will not close his eyes when the eyeball is touched; these symptoms will continue from six, twelve, twenty-four hours. The sudden stoppage of the action of the bowels is generally accepted by the surrounding friends as a good sign, but it is only a paralysis of the muscles of the bowels, and the patient dies without any pain.

In cases not resulting in death, the bowels move less frequently and less in quantity, the pulse may be felt, the blueness of the skin disappears, the stools get to be colored and an odor or constipation appears, the action of the kidneys begins again, and the patient improves gradually. In some cases the patient improves only to fall into the deadly hands of typhus or typhoid.

Places not affected with this horrible disease, should quarantine themselves against infected places. Closets where the stools of cholera patients had been emptied should not be used. Into these strong solutions of sulphate of iron and chloride of lime should be poured, to prevent the formation of the cholera germs and prevent those already formed from being carried by persons from these infected closets to health houses and places. That it is an excellent way to move from such houses, need not not be mentioned, and those whose means allow them, to travel to some unafflicted town, should do so without hesitation. Never use a strange closet, and an excellent way is, never to use the closets in their own home, but always use a vessel. Watery discharges and rumbling sounds in the stomach, should always be cause enough to call in a physician, and until the appearance of the doctor, the patient may go to bed; he should take one or more cups of black, strong coffee, with a little good cognac, also some suitable prescription. The cure, of course, is left entirely to the physician, but he will use some of the following medicines: Opium, ice-champagne, and cold application over the region of the stomach. Milch and meat juice bouillon respectively, should be about the only nourishment given to the patient.

The Cholera seems to be making its dreaded march over continental Europe, and has already reached Liverpool, whence it must soon find its way to London. There seems to be every prospect that, before the month of August is over, this dreadful scourge will reach American shores, no matter what precautions are taken at our seaports to stay its progress. In that event, the business depression would be much worse than it is at the present time, especially should this disease invade our large manufacturing centers, which it is likely to do if it crosses the ocean. A translation of an article from the German, in relation to the cause and prevention of the cholera, which will be found in another column, will be found of special interest in view of the above probability.

Stockings and Health.—White stockings are coming again into vogue. Doctors have discovered that the sole of the foot absorbs dyes, whether black or colored, and that a continuous process of slow blood-poisoning is going on among those who use colored hosiery. The origin of several new diseases that have lately appeared is attributed by medical men to the pernicious dye-stuffs which are used in the manufacture of stockings.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

CLEAN-UP.—*Ledger*, Aug. 23: The clean-up of the Telegraph Hill gravel claim, situated in Upper Rancharia district and owned by George Evans and M. F. Fitzgerald, was made recently, and realized about $3,000 for not quite four months' run. The water supply has given out for the season, but drifting operations will be carried on to a limited extent until water can be had. There are no gravel claims at work at present in the district.

MISCELLANEOUS.—The last run of the Lighthouse mine, near Butte City yielded $9 per ton, an increase of 50 per cent over the previous run. The Plymouth Consolidated has declared its usual monthly dividend of 50 cents per share. The derrick operated by a Knight wheel put up by the Volcano Gold Gravel Mining Company, on their claim at Volcano basin, is about completed. It is hoped that this plan will prove a success. The enterprising stockholders have sunk a large amount of money in this mining venture, with altogether inadequate returns so far.

IN LITIGATION.—Cor. *Ledger*, Aug. 23: Hostilities on Mahoney hill continue. The statement in my last that Mr. Stewart took the ditch water for salary, was an error. It seems that the Lincoln mine, according to articles of agreement with the Mahoney, has the first right to the water, the Mahoney being entitled to the surplusage. Mr. Stewart in making preparations to start up the Lincoln mill, gave the Mahoney Company two weeks notice that they must make other arrangements for water. At expiration of the time Mr. Stewart with a force of men disconnected the Mahoney pipe, and turned the water to the Lincoln. Mr. Morgan, who was in San Francisco at the time, was at once notified of the occurrence, and immediately started back, and on his arrival proceeded with a number of men backed by a double-barreled shotgun, and replaced the pipe in its former position, where it still remains. The matter is in the courts for unravelment or further entanglement.

CANAL BREAK.—*Sentinel*, Aug. 27: The Amador canal had a serious break near its head on Monday, entirely shutting off the water supply and compelling suspension of work at mills. The cannon-ball quartz mill recently put up at the Dewitt claim is said to work satisfactorily. It has a capacity of ten tons in 24 hours and can be run with 20 inches of water. The ore is pulverized exceedingly fine. A new quartz prospect has been obtained on Sutter hill, near Botto's. It is said to have produced some very good looking rock.

Calaveras.

WEST POINT.—Cor. Calaveras *Chronicle*, Aug. 23: The mining interests are undergoing a complete revolution, and old mines that have long lain idle will begin life anew and turn out their pro rata of gold along with those now in working order. For some years past a majority of our principle quartz veins have undergone a great change; sulphurated rock has taken the place of the decomposed quartz that was always free-milling and found above the water level. The question has long been a hard problem as how to extract the gold from the sulphurated quartz that is found below water level. It has been known for some time that only half the gold was ever saved by the present milling system out of the sulphurated rock, and although numbers have tried they have only partially succeeded, which of course would not pay. Now comes the Russell process to the front, which from its simplicity and the confidence reposed in it by the many who have seen it in working order gives it a substantial basis, and they are confident, along with the owners that it will revolutionize and eventually take the place of others in this district in the extraction of gold from the sulphurated quartz, no matter how base. Messrs. Schives and Russell have struck some splendid quartz in the Lockwood mine and are working it full-handed, night and day, by a whim shaft south and an engine shaft north. Both shafts are on first-class rock. The shaft on the Point mine has been cleaned out and newly timbered, and men are now engaged in sinking on the lode, which shows considerable gold. The Bismarck mine owners are stopping out rich quartz; about 40 tons in the mill and plenty more in the mine. The Scorpion mine is at present idle, owing to a defect in the affairs of the company, not in the mine I assure you. The Billy Williams mine is again to be opened by Messrs. Rowe and Jenkins. The Blazing Star mine is awaiting machinery. The Old Henry mine looks splendid. The Mexican mine will soon be in operation under the superintendence of Mr. T. Waters. The Wide West is short-handed; plenty of good rock on the dumps. Good rock has been struck in the Greeley mine on Bear creek.

El Dorado.

PYRAMID MINE.—*Mountain Democrat*, Aug. 23 Supt. Hotchkins will at once erect a fine 10-stamp mill on this old mine, which is located near Rose Springs in White Oak township. The ore in this mine carries a very large proportion of sulphurets, and it is believed by those who have worked it in the past that the Pyramid will prove a fine paying property.

BETTER THAN EVER.—Supt. Roberts, of the Crystal mine, Mud Springs township, was in town last Monday, and left with L. Landecker a specimen of remarkably fine quartz for exhibition at the county fair. The ledge where this piece was taken out is full six ft wide, and nearly half sulphurets, which assays $892 per ton. The Crystal is a fine paying mine.

Fresno.

QUARTZ MOUNTAIN.—Mariposa *Herald*, Aug. 23: Joe Swanstrom, of Coarse Gold gulch, Fresno county, was in town this week, and from him we gathered the following items of news: Quartz Mountain is the scene of lively mining operations at this time, about fifty men being at work. The company have located a town and are rapidly putting up houses. Two saloons are already running and a church will soon be built to counteract their evil influences. A contract has been let to build a canal from the San Joaquin river to the mines, the canal to be finished by the 1st of November. A great deal of money is being spent by the company and great results are expected. It is said that a smelter will soon be in operation at Mt. Raymond, and if the results are satisfactory a double and twisted boom may be expected at that place in about six weeks. The people at Fresno Flats, who own most of the claims, have the utmost confidence in their value.

Humboldt.

RICHNESS.—Trinity *Journal*, August 23: The quartz mines on New River bid fair to prove even richer than at first expected. Clifford & Co. made another clean-up a few days ago, after a run of eleven days with their arastra, which is a small one, and took out $3,500. Smith B. Brooks was in town this week, and tells us that he has discovered four ledges which prospect, but most of his work has been done on the Mary Blane. On this ledge they are now forty feet, and Mr. Brooks says they have seen gold in the rock every day. The lode is well defined, averaging about two feet in width. Other ledges in the district continue to increase in size and richness as they are developed. One 5-stamp mill is now going up and others will speedily follow. A new trial to the mines is proposed, by way of North Fork and Rattlesnake, the distance from Weaverville by this route being only 57 miles. There are about 75 men in the district at present, and two stores, two saloons, and a hotel already running from the nucleus, of what will next season be the most flourishing quartz mining town on the coast.

Inyo.

BULLION.—Inyo *Independent*, Aug. 23: Last week 20,000 pounds of bullion were shipped from Keeler for Selby & Co., San Francisco. The bullion belonged to the owners of the Molock mine. A few men are at work at Mammoth; they are getting out fair ore.

Mono.

A COLLAPSE.—Homer *Mining Index*, Aug. 23: Early Thursday morning Under-sheriff Wilcox arrived from Bridgeport and attached the May Lundy mine and personal property, to satisfy a debt of $12,592 due Rosenwald, Coblentz & Co. In the afternoon of the same day George W. Penter attached the same property (including the mill) for $7,372.35, making a total of $19,964.35. It is understood that on the same day Donnelly & Hune will sued out an attachment for about $1,700. The day shift in the mine worked half a day Thursday, when the miners held a meeting, appointed one of their number to hold possession for them, and then retired from the hill. The Sheriff also put in a keeper at the mine and another at the mill. The mill was run until 9 o'clock Thursday evening and then shut down. So far as learned no liens have yet been filed against the property for labor or materials, the men having confidence that a settlement will be made before the expiration of the time allowed by law for filing liens. The entire indebtedness of the property, including the bills attached for labor, material and last year's taxes, is variously estimated at from $38,000 to $45,000, and it seems to be the general impression that the whole of this will be paid within a reasonable length of time—that is, without allowing the law to take its course—whether the expected private sale takes place or not. The collapse has cast a gloom over the business and laboring men of the community, and still the foreknowledge that some such crisis was inevitable relieved the blow of the greater portion of its force, and our people are disposed to feel somewhat cheerful, if not jubilant, over the long-wished-for change, even though it comes in the guise of disaster. Yesterday the hoarding houses were refused further credit from the stores, and were compelled to shut out all who were without money—and perhaps one hundred of the May Lundy miners were, as they had not received any pay for nearly two months. This brought about a crisis, and the unpaid men, unwilling to submit to a "freeze out" game, called a meeting at Abbott Hall last night and quietly resolved to "eat." A committee waited upon Rosenwald, Coblentz & Co., and asked that firm to furnish the men with provisions until the 1st proximo, taking their time checks for security, which Mr. Rosenwald consented to do.

STANDARD CON.—Bodie *Free Press*, Aug. 25: They extracted and shipped to the mill 540 tons of ore, and 620 tons of tailings. We received from the ore 93 ounces of crude bullion, and from the tailings 460 ounces, which will be milled and shipped with this week's run on the 1st instant.

BODIE CON.—During the past week 200 tons of tailings were worked at the mine, the average assay made was $8 per ton. They have now reached the Mono line on the 55 level and will commence crosscutting as soon as we have the timbers in place. Thirty-seven men employed.

CON. PACIFIC.—Since last reports the drift on Pacific No. 1 has been advanced 32 ft from chute. The ledge is looking better than at any time since work was resumed. A number of assays made during the week have been more satisfactory than any heretofore obtained, ranging from $7 to $200, and making an average of $72.

NEW STANDARD.—Everything is running along nicely at the mine. The owners have a force of 10 miners working in the mine. They purchased or C. C. Stevenson of Virginia City the Miners' mill, which is being overhauled and will be ready to steam up on the 5th ultimo. A contract has been entered into with Marden & Son for hauling the ore. Wood for the winter's run is being delivered at the mill.

BULWER CON.—South drift No. 3, 500 level, has connected with workings from the Bodie mine. The vein is small and of low grade.

Mariposa.

DILTZ MINE.—Cor. Mariposa *Gazette*, Aug. 23: I have started a shaft and am now down on the vein 14 ft, which shall will strike the old car level at a depth of 100 ft, and about 30 ft north of the head of the tunnel. The vein at the surface was merely a fissure, but is now nearly one foot thick and the ore is a fine decomposed quartz or sand, and prospects well with fine gold. I think the developments which will accrue from the sinking of this shaft will prove most conclusively all that has been said of this mine, viz., that it is worth to a company or corporation, a sum not to exceed less than $200,000, and the day is not far distant when capitalists will be eager to have it.

Nevada.

EAGLE BIRD MINE.—*Transcript*, Aug. 22: Most encouraging reports continue to come from the Eagle Bird quartz mine, above the town of Washington. The shaft has attained a depth of 150 ft and shows a ten-foot vein of good average ore in the bottom. At this point drifts are being run to the north and south. At the 80-foot level the north drift is in 90 ft with the vein 7½ ft thick at the head of the drift, while the south drift, which shows a 4½-foot vein, is in 220 ft. The ore taken from the 80-foot level averages $13.60 in the mill, while that from the 150-foot level averages over $19 a ton. It is the intention of the owners to sink 400 ft, when if the good indications hold out a 20 or 30-stamp mill will be built.

MINING INJUNCTION.—Nevada *Herald*, Aug. 23: The Mayflower Mining Company, operating on Canada Hill, was enjoined Tuesday from working their mine by the hydraulic process. They will clean up and close down in a few days. It was the intention of the company to drift their claim at some future day, provided a channel was found in the hill, and the hydranlicing was being done to demonstrate whether a channel exists there or not.

MARYLAND MINE.—Grass Valley *Union*, Aug. 24: The 6-ft Pelton water-wheel to drive the pumping and hoisting works of the Maryland mine has been set up, and all connections made with the Idaho pipe line, and by the last of the present week the water will be turned on. The pressure will be over 300 ft, sufficient to drive all the machinery under a head of about 20 inches of water. A two-compartment shaft is opened and timbered from the surface to the drain tunnel, a depth of 125 ft, and below that point is 20 ft deep. When the works are started up this 20 ft of shaft will be immediately pumped out and the work of sinking resumed, miners being already employed for that purpose. An 8-inch pump will be used in sinking, and is now on the ground, with all the connections, to be put in place as soon as needed. Beside the works, which are new and conveniently arranged, a separate building 18x24 is being put up to be used as a storehouse and office. The work on the mine is being done under the superintendency of Mr. S. P. Dorsey, who is the principal owner of the Maryland property. The sinking of the shaft is to be prosecuted vigorously, and good results are confidently anticipated.

Plumas.

WILL START UP.—*National*, Aug. 23: It is reported on good authority that extensive operations will soon commence on the Indian Valley mine again, and that the work of opening it will be vigorously prosecuted. Mr. Geo. P. Cornell, who will be in charge of operations there, is now in the lower country, completing his arrangements, and will soon be back. We are pleased to hear this report. The Indian Valley has proved one of the best mines in Plumas, an in the opinion of mining men it will put forth a large amount of "bullion" for years and years to come.

HALLSTED MINE.—Another run of about six tons of quartz was put through the water arastra at the Hallsted mine last week, and the clean-up showed $60 per ton. That kind of rock counts, even in working in a small way. The owners are now making an opening in a new place on the ledge, where they have reason to expect some rich developments. It is to be regretted that some company does not own this mine with the necessary capital to erect proper machinery, for it would make a showing that would not only be good for the owners, but of vast benefit to the whole county. The Hallsted mine is only one location of a dozen, any one of which, if properly developed, would be a bonanza.

THE UNION.—A gentleman who was over in the Gibsonville country last week, gives a good account of this mine, which is again paying splendidly. He saw an oyster can full of beautiful gold, the result of one week's work by five men. It is reported that $3,000 was taken from one car-load recently.

LUCKY S.—The work of putting up a mill on this ledge is being prosecuted as rapidly as possible. The Greenville Foundry has the contract for the castings, and will soon have them completed. Mr. Dorsh, of this place, is making 600 feet of iron pipe, which will convey water to the wheel under a pressure of 160 ft. Five stamps will be put in at once, and five more as soon as the managers think best. It is expected that the mill will be in running order some time in September.

RUNNING NICELY.—The Leavitt & Loring mine at Elizabethtown is paying well, and everything is in good running order. The pump handles the water easily, and no trouble is had on that score. The dump, water-tank, washing flume, and all the working arrangements are built with a view to economy, and the owners now feel that they have a mining property which will bring them a fortune. No very coarse gold has been obtained so far, but pieces weighing from five to ten dollars are not uncommon. Some fifteen or twenty men are employed at the mine.

Shasta.

LOOKING WELL.—Shasta *Courier*, Aug. 23: The Mammoth mine at Old Diggings is looking splendidly, and Frank Yung writes that the Little Central is looking even better than the Mammoth. The new shaft in the Little Central ledge is down 18 ft. Over 200 tons of quartz are now out of the Mammoth and Little Central claims, and the ore is very rich, estimated at over $200 to the ton, and there are thousands of tons in sight and easily extracted.

San Bernardino.

IMPORTANT MINING OPERATIONS.—Calico *Print*, Aug. 23: Last week Mrs. A. K. Townsend returned to Calico from San Francisco, where she had been for three or four months, and returned the following day to the city. Last Wednesday she again came down from the city and went back yesterday accompanied by Ed. Gibson, who has been employed in developing some of her mines. Mrs. Townsend has for some time been trying to get capitalists to invest in her mining property, and has finally succeeded after overcoming obstacles that would have baffled many less resolute and enterprising operators in mining matters. She has bought out all her partners' interests in the Alhambra, Golconda, and two Vicksburg mines in East Calico, and transferred one half of the same to a rich firm in San Francisco, who will immediately proceed to put up a stamp mill near Calico, and will put on a large force of men to develop the above mines. Mr. Gibson's trip to San Francisco is for the purpose of returning with machinery to bore a well on the proposed mill-site.

Siskiyou.

SAWYER'S BAR.—Cor. Yreka *Union*, August 23: Messrs. Klein & Moore, who own the Deep Channel claim, situated on the river below Mohr & Co.'s claim, will be ready to commence sinking in a few days. They have been to considerable expense in rigging up their claim and bringing on water. The claim is quite deep and difficult to work, but it is thought that there is big pay convenient to the bedrock. We hope the parties may be suitably rewarded for their enterprise and industry. William Burns has finished washing up his ground sluice, and it is supposed with the usual satisfactory results. It is rumored that Mr. Benton, who has resided on Russian creek, near its confluence with the North Fork, has, in the past few days, struck it rich, having taken out 80 ounces in one week, and has taken out altogether two thousand dollars. Mr. Benton has worked near that place for about eight years, and for most of the time, has been alone. The Mohr & Co. and the Rundel & Barry claims are in full blast and doing well.

PICK AND PAN.—Yreka *Union*, August 23: From 21 tons of rock, Brown & Co., of French Gulch, realized $1,071, an average of $51 per ton. Schroder & Co., at the head of the East Fork of Deadwood, have discovered the richest vein of quartz ever struck in this county. There are pieces of rock in the dump that are probably the size of an ordinary satchel, and the gold in them is as thickly interwoven as moss. The owners will wager any amount that two hundred dollars can be pounded from any one of the pieces referred to. From a bucket of decomposed rock, $25 has been realized. The vein, 75 feet in is 15 feet wide, well defined, and every pound of it pays. The owners, without croppings or other signs to guide them, other than the appearance of the country, commenced prospecting for the ledge a year ago with the success above noted.

NEVADA.

Washoe District.

HALE AND NORCROSS.—The northwest drift on the 2800 level was yesterday out about 40 ft. The face was showing a considerable amount of quartz of good grain and appearance, but carrying very little metal. This drift is not now following the diamond drill hole. It has been directed more to the northward, and it is the intention to push it through to the Savage south line. A west cross-cut will presently be made from it to the ore deposit first found, or rather to a point a short distance north of that ore body. This cross-cut will require to be but about 30 ft in length. The usual amount of ore is being extracted on the 200 level.

SIERRA NEVADA.—Are repairing the drift on the 2300 level through which passes the compressed air pipe. On the 3200 level the joint Sierra Nevada, Union Con., Ophir and Mexican winze has been sunk and timbered 8 ft. Since last report a considerable amount of porphyry has made its appearance in the bottom of the winze. This porphyry has crowded out the bastard quartz, and in turn will probably give place to genuine and fertile quartz.

ALTA AND BENTON.—The west drift on the 2150 level continue in quartz of a good quality, which carries some metal. The branch drift into the Benton ground is in quartz of about the same kind. A second diamond drill hole was yesterday started from the face of the east drift. This will be a two inch hole, and will materially hasten the draining out of the ground lying to the east.

BEST AND BELCHER.—The west drift on the 2500 level is out about 565 ft and is in soft and favorable vein porphyry. The drift has yet about 100 ft to go to get under the point where quartz and a good prospect were found above. The north drift from the 825 station of the Bonner shaft is out about 300 ft and is in vein porphyry with some seams of clay and stringers of quartz.

OPHIR.—On the 250 level are taking out fillings. On the 500 level the west drift has been extended 70 feet. The joint Sierra Nevada, Mexican and Union Con. winze below the 3200 level has been sunk and timbered 8 ft. The bottom is showing a preponderance of porphyry; over the bastard quartz so long forming the principal material in the winze.

UNION CON.—On the 3200 level the joint Mexican, Ophir and Sierra Nevada winze has been sunk and timbered 8 ft. It is now down about 82 ft. Porphyry predominates at the bottom. Below this porphyry the fertile quartz lying to the west above is expected to make its appearance.

MEXICAN.—The joint Ophir, Sierra Nevada and Union Con. winze below the 3200 level has been sunk and timbered 8 ft. The usual vein porphyry is taking the place of the bastard quartz which has heretofore been the predominant material at the bottom of the winze.

CHOLLAR.—The west cross-cut from the main south lateral drift on the 2800 level is still being advanced in a solid body of quartz of good appearance and which carries a small amount of metal. The ground continues dry.

YELLOW JACKET.—Work in this mine is going on about as usual, and an amount of ore sufficient to keep the mills on the river running to their full capacity is being extracted. The usual amount of prospecting is being done.

UTAH.—The material encounter in the southeast drift on the 1950 level continues soft and favorable. There is no water to interfere.

ALPHA.—The north drift continues in quartz carrying a small amount of metal.

ANDES.—The prospecting drifts are encountering quartz of a favorable appearance, and about the usual amount of low grade ore is being found.

CROWN POINT.—All work is going on about as usual. Sufficient low-grade ore is being extracted to keep the river mills in full and constant operation.

SCORPION.—The usual progress is being made in the north drift on the 500 level, and the material remains about the same as heretofore.

BELCHER.—The usual quantity and quality of ore is being taken out on the old upper levels and sent to the mills on the Carson river.

CON. VIRGINIA AND CALIFORNIA.—Drifting on the 2900 level is, about to be resumed. The holes thus far have shown very wet ground.

Belmont District.

BELMONT. *Courier*, Aug. 23: Stope No. 1 has improved very much. It is opened 50 ft in length with fine ore 3 to 6 ft in thickness. Stope No. 4 and understopes 1 and 2 all holding their size and yielding splendid ore. Mill doing excellent work, except has been shut down five days on account of broken cam shaft. Will start up again to-night. Shipped $4,000 in bullion. Hereafter regular shipments will be made for months to come.

Bullion District.

THE BULLION MINES.—Virginia *Enterprise*, August 21: A new bullion-producer is the district twenty miler east of Beowawe, where Fred. Hutchins and Charley Stoddard had some claims a couple of years ago. The Silverside ships to Salt Lake, and the Lady of the Lake has a mill. Dr. Frisbie, of Vallejo, is the principal owner in the Lady of the Lake. It has shipped $20,000 this summer, and has a good body of ore. It is down only 100 feet. Grayson & Benson own the Riverside. The ore goes from $80 to $1,000 per ton, and is free milling. It ships about $3,000 to a car-load, and averages a car-load a month. It is down seventy feet, with a tunnel 300 feet long.

Cortez District.

A GOOD MINE.—Reno *Gazette*, August 21: Mr. Newban's mine at Cortez is looking better than ever. He shipped last week twelve bars of bullion, worth about $1,100 each, and he ships something every month. He has plenty of good ore in sight. He thinks the mine will last a life-time. He is laying a two-inch iron pipe to bring water eight miles, and will build a mill near the mine. He now hauls the ore eight miles to his mill.

Jersey District.

LOCATED.—*Silver State*, August 21: Several mining claims have recently been located in Jersey District, which is located in the southeastern part of this county near the Lander line. Some years ago there was quite a rush to the district, and one of the mines, which was worked to some extent, produced considerable base bullion. The ores then worked carried a high percentage of galena, and were smelted.

Sacramento District.

THE HUMBOLDT QUEEN.—*Silver State*, Aug. 21: An important strike has been made on the Humboldt Queen mine, near Rye Patch. Reports from reliable sources are to the effect that a large body of very rich ore has been found in the mine at a depth of 125 ft from the surface. The strike is said to be the most important ever made in Sacramento district. The extent of the ore body is not yet known.

Taylor District.

MINERAL RESOURCE. Cor. Pioche *Record*, Aug. 20: After a close inspection of the mineral resources of Taylor, I am of the opinion that the camp is coming to the front at no distant day as a large bullion producer. Both the Monitor and Argus companies are extracting a very fine character of high-grade ore, besides doing considerable prospecting in both the mines. The Augus mill, at present undergoing repairs, will be able to start in a few days, when a long and prosperous run will be made. The ore in the Monitor lies flat, and in oblong chambers, some of which are 100 ft in length by 30 in width, between quartzite and lime, with a streak of porphyry occasionally on the footwall. The hanging wall is quartzite. The richest ore is found in a hard slate, liberally streaked with black metal and chloride of silver, and assays from $150 up to $1,500. The ore at present being extracted averages $120 per ton. The ore in the mine was first discovered under grass roots, and has been persistently followed ever since, which policy is being successfully carried out to-day. The fortunate owners of this little bonanza are Robert Briggs, W. G. Lyons and W. N. McGill, all practical miners, and they have realized during the past two years, that is from the 1st of September, 1881, to the 14th day of July, 1884, the snug little sum of $361,000, with a whim for hoisting works. There are several other mining claims in and around camp that only need a little muscle, backed up with small capital, to make them paying properties, for there is most assuredly a rich mineral belt running through this section. Taking it all in all Taylor is a promising camp, and the citizens of the county owe a debt of gratitude to the few enterprising men who unaided by capital have done more toward establishing legitimate mining than any corporation in the State.

Tuscarora District.

NORTH BELLE ISLE.—The usual progress has been made with the work on the 70-ft level. Have started a cross-cut east 30 ft from the face of the main drift north.

BELLE ISLE.—North drift, on the east vein 150-ft level, has been advanced 8 ft. The vein is of a fair width for high grade.

NAVAJO.—Drift south from joint Belle Isle and Navajoline cross-cut has been extended 11 ft. The ledge and pay ore is the full width of the drift. Good progress is being made with the work at all other points.

GRAND PRIZE.—Stopes above the 400 have improved in the last few days, and are now yielding some very good ore. Mill is running all right.

ARIZONA.

EMERALD.—Tombstone *Epitaph*, Aug. 23: The Emerald mine now presents a busy scene. Several new buildings are going up, the principal one being the new hoisting works. The gallows frame is erected. The machinery, formerly on the Sunset mine, is in place, and will be ready to start up by the 1st of September. A large force of men are employed in the mine and on top, and the indications are that it will be worked for all there is in it.

A GOOD MINE WELL WORKED.—Prescott *Courier*, Aug. 23: The Lane mine, which was purchased some months since by the company represented by Mr. T. J. Eaman, has, under his able supervision, an exceptionally fine record as a bullion producer. A four-stamp mill was started on the ore from this mine on the 12th of June. In two months from date of starting 300 tons of ore were crushed, which paid between $50,000 and $60,000. From August 1st to the 19th the net bullion product has been $26,000. The mine has paid the original purchase money—all running expenses. There are on hand three months' supplies of material and the surface only has been broached, so to speak. The mine is undoubtedly a good one, and Mr. Eaman is one of the few millmen who know just exactly how to profitably work such a bonanza.

BRADSHAW.—Cor. Prescott *Courier*, Aug. 23 Although we receive but very little notice from the press, yet there is considerable mining carried on here, perhaps more extensively than at many other mining camps. Brittingham, Bond and Hayden are making preparations for starting the Bradshaw Basin mill on ore from their mine. This mine is by far the best mine in this neighborhood. They have on the dump 500 tons of ore which will mill $100 per ton, and as the mine is well opened up and prospected plenty more ore can easily be extracted. We often hear it said that a person can sell a good mine any time, but that this assertion is not always strictly true is demonstrated when it is well known that this is a good mine. An offer of $18,000 was made, but refused by the owners, for the entire ore and mine. I think no sane man would accept such an offer for 500 tons of $100 ore and the mine in the bargain. As they had no chance to dispose of their ore and mine to advantage they have leased the Basin mill for the reduction of the ore. Mr. Riggs, the well-known old-timer, is taking out good ore from the Tiger. The ore is being taken from drifts run on the old shaft. This shaft was sunk in '71, under the superintendence of Mr. Riggs. He will find plenty of good ore yet in the old Tiger, no doubt. The water is forced out of the shaft with a syphon. This mine, with proper management, similar to the excellent management the Tip Top mine had, would have been a bullion producer these past three years, since it has been lying idle. At the Del Pasco quite a number of miners are prospecting their respective claims and taking out some good gold ore since the Del Pasco mill started operation, and all seem to be well satisfied with the fruits of their labor. The Lane mine continues to turn out high-grade ore which is being reduced at the Tuscumbia mill. I have been informed that an additional force of miners have been employed, which is evident that they have "struck" it better than ever.

MOHAVE.—*Miner*, Aug. 21: Ewing & Goshorn have just shipped twelve tons of ore from the Atlanta mine at Chloride. Wm. McCue was over from the Black and Tan mine last Wednesday and reports everything looking well at that mine. He and his partners are drifting on the ledge and have a good streak of pay ore, with assays running from 45 to 225 ounces to the ton. J. J. Hyde shipped a car-load of ore from the Standby mine to the Benson smelter last week. The concentrators at the New London mine are working to perfection, and all low-grade galena and screenings, etc., are now concentrated and then shipped to the Benson smelter. Superintendent Raymond, of the Champion mine, is having some large tanks built preparatory to putting in some concentrators similar to those on the New London mine.

NEW CANNON BALL MILL.—Tucson *Star*, Aug. 20: The Dyer cannon ball mill now in process of erection on the Galdtree and Schultz mine on the San Pedro will be completed and in operation in about ten days. If this mill is a success, a second, and later on a third mill will be put up. The present mill has a guaranteed capacity of 12 tons per day. The frame-work for the second mill is already being built. The ore is rich in free gold, and as there is an abundance of it, it will no doubt prove a bonanza to its fortunate owners.

COLORADO.

GENERAL NOTES.—Colorado *Miner*, August 21: A mill run from the Multum in Parvo lode, gave returns of 236 ounces silver per ton. John Hite & Co. have a small streak of good ore in the Glendower lode on Columbia mountain. Messrs. Hamilton and Willets have taken a lease on the Silver Belt lode on Leavenworth mountain. A late mill run from the Joe Reynolds' No. 1 gave 246 and 146 ounces silver per ton, according to class. The Bismark lode on Sherman mountain is being worked by several parties of lessees with remunerative results. The Echo shows a good vein of ore, which mills 340 ounces silver. Mr. William J. Mitchell is superintendent, Ed. Jones & Co. have taken a lease on the Centennial lode. This mine is reported as looking exceedingly well at present. A mill run from Hugh Behan & Co.'s lease on the Joe Reynolds' lode, Monday, gave 287 ounces first class and 186 ounces second class. Henry Parker & Co. have been leasing on the Hidden Treasure lode, at Empire, for some weeks. This vein carries horn silver, and gives promise of becoming a very valuable lode. The Forrest Rose shows a good streak of quartz, scattered through with mineral, which, unassorted, mills 100 ounces silver; and, assorted, runs 430 ounces. One small streak, one and a half inches wide, shows solid ruby. The Fulton lode, on Sherman mountain, still continues a steady producer. Twelve tons of ore were shipped from this mine last Tuesday. Reports from the Mendota are to the effect that the mine is still improving as development progresses. Next week there will be large shipments of ore. A company has been formed in St. Louis on the Homestretch, Forrest Rose, and Echo lodes, located at Williams Fork district. The first named lode shows about one inch of solid ore carrying ruby silver, silver glance, gray copper and native silver, which mills one ounce in gold and 116 ounces silver. A valuable strike was made in the Victoria tunnel this week. It is not definitely known, as yet, what lode it is, but, in all probability, it is the Mendota. Two inches of solid mineral was encountered last Thursday evening, and since then they have opened out about eighteen inches. The lode struck has a perceptible dip, and is about seventeen feet between walls.

IDAHO.

GOLCONDA.—Idaho *Statesman*, Aug. 16: Mr. James Monroe, of the Golconda mine, Boise county, was in the city yesterday. He says that he has his 5-stamp mill running on good ore, crushing at the rate of ten tons per day. He has not yet made a general clean-up, but the yield from the plates indicate satisfactory results. Mr. Monroe is well acquainted with the Banner property, and says that he considers the prospects of that camp the best of any in the Territory. In the Banner mine there is good ore enough already developed and in sight to keep the 20-stamp mill running constantly for two years, while the indications for a continuation of the rich vein are as good as when first discovered.

THE BASIN.—Cor. Idaho *Statesman*, Aug. 19: There is very little placer mining going on at present in the Basin, the season being about over. At Pioneerville, work is being vigorously pushed at the placer claim of Ben Willson. The mines in this part of the Basin have all yielded well this season, and are far from being worked out. The Gold Hill mine has suspended all work, for the present at least. Nothing will be definitely known until the arrival of Mr. Mootry, one of the owners. Messrs. Dave and William Coughanour, two of the principal owners of the mine, do not feel disposed to sink any farther at present. This it will be necessary to do before much can be accomplished, as the ground is pretty well worked out down to the 400-ft level. In company with Mr. W. H. Davidson we visited Quartzburg and the mine. They had just finished taking out the pump. The mill is full of ore, which will be crushed in probably three weeks. A cannon-ball mill passed through this place the other day, to be used in crushing ore from the Centennial mine, there being now about 200 tons on the dump. Through a kind invitation from Mr. W. G. Harden, we paid a visit to the Centennial and the Belshazzar mines, in both of which Mr. Harden is one of the principal owners. The Belshazzar has about 200 tons on the dump, most of which will assay well. The ledge is 15 ft wide, and a large portion of it is uncovered, it is no doubt a valuable property.

IDAHO CITY.—The Elmira Company at Banner have started up their mill and the first two bricks for this season came down to Idaho City while we were there. The weight was about 100 pounds and value about $1,500. They expect to turn out $1,000 a day all summer. James Monroe has started his 5-stamp mill and made a good run, and brought the bullion down to the assay office in this city last week. K. P. Plowman has not cleaned up his placer run, but will in a few days. He, as well as others who know the ground he has moved, anticipate he will have the largest yield his mine has ever made. The amount is put at from $50,000 to $75,000. Channel & Co., on Willow Creek, have had an excellent run, but have not cleaned up, and Ben Wilson, at Pioneer, has made a heavy run this year, and Doc Noble, farther up Grimes Creek, has made a good run. Mr. James Moriarity, Wells, Fargo & Co.'s agent, and Mr. Church, cashier of the Boise County Bank, who handle most of the bullion and gold dust, and who know best about the product of the mines, told us the yield would be largely in excess of any year for some time past. The shutting down of the Gold Hill mill is supposed to be temporary, but whether it is or no, the mines are improving in Boise county, and business correspondingly so.

NARROW GAUGE GULCH.—Wood River *Times*, August 21: Superintendent James A. Wilson, of the Narrow Gauge and Bannack group of mines, was in town to-day. He reports everything working satisfactorily up in Narrow Gauge gulch. His concentrating works have just run through a 20-ton lot of ore from the French Boys' group, but the result is not yet known. If satisfactory, it will be a God-send to the French Boys, as they have a mountain of ore, but of low grade. Two good strikes have recently been made in one of the side gulches off of Narrow Gauge gulch, and in the Narrow Gauges they are driving toward an ore-chute, with every prospect of striking ore soon.

MONTANA.

ITEMS FROM THE MINES.—Butte *Miner*, Aug. 20: This report concerns only mines on the west side of the city of Butte. The mines west of Missoula Gulch and being worked now, are, for the most part, in the Manganese belt. Most of them could not be worked profitably a few years ago, when they were located on account of a lack of facilities for reducing the ore, and because so much of it was low-grade. But now the smelters pay a good price for it, because they need the manganese in the reduction of other ores. These mines are as yet hardly anything more than prospects.

THE STEVENS.—A controlling interest in this mine was bought some time ago by Judge A. J. Davis, and work began on June 19th; a pump was started to work. Saturday night a force of hands was put on to begin the work of cleaning out the levels and getting the mine in shape for work.

THE SATURN.—This lode is almost directly west of the Stevens, and across the Missoula gulch. It is being worked now on a lease by Sorenson and Baker. They are down on the shaft 30 ft. The vein is five feet wide and the pay streak varies from six inches to one foot. They have been selling the ore to the Colorado smelter and it has averaged 200 ounces.

THE STAR WEST.—This lead is northwest of and close to the Dexter mine and has been lying idle for a year or more. It has recently been leased by Hoar Bros. & Co., who have lately quit work on the Andy Johnson. This company have moved the boiler and hoisting machinery from the Mountain Boy and are preparing to go to work in earnest in the lead.

THE PLACER LODE.—This property belongs to Mr. Wayne Bernard and is now being worked by Messrs. Vineyard, Sorenson & Hutchinson, who have leased it for a year. There is a shaft on this lead fifty ft deep worked with a windlass, from which lessees, have within the last few months, taken forty tons of ore running from seventy to one hundred and ten ounces.

THE CZARINA.—Owned by C. W. Farlin, southwest of Butte, has a 30-ft shaft from which some good ore has been taken. Woodmanse & Co. have a lease of 400 ft on the west end of the Czarina. They are working in a forty foot shaft, and have run a short level east and west. On Saturday they made a rich strike showing 200 ounce ore.

MAPLETON.—This lead is owned by Foster, Rosenthal and the Harvey McKinstry estate. Mathews & Co. have a lease on the east end of the claim. They are working in a 27-ft shaft. Near the surface they made a rich strike, but lower down the lead dipped north. On the west end of the Mapleton, King & Co. have a lease. They have just begun work in an old 30-ft shaft. At that depth the vein is nine ft wide and runs 35 ounces in silver and 59 per cent manganese. Southwest from the Mapleton is the Washington Lady, leased for two years by Peiler & Blandino. The shaft is being sunk so as to strike the lead about 50 ft below the surface. The Burlington is being worked on a lease by Master & Co. They have lately begun work in an old 60-ft shaft and have been running levels east and west at that depth. The Fredonia, leased by Buzzo & Co. They have a shaft of 160 ft worked by a windlass. They are working in the stopes at the 50-ft levels and are taking out ore that runs 20 ounces silver and 70 per cent manganese.

A NEW MILL.—*Inter Mountain*, August 21 A long-pending negotiation, Messrs. Stonebreaker, Laws, and other Baltimore capitalists on one side, and Patrick O'Donnell on the other, was brought to a successful conclusion to-day through the efforts of Messrs. Hammer & Nesbitt, of Butte, with reference to the Marget Ann mine. The property is developed by a shaft 80 feet deep, from which two levels have been extended, exposing in both the east and west drifts a fine and compact ore body having an average width of four feet of pay rock, though the ledge itself is much wider. The claim contains two ledges, but only one of them has been developed to any considerable extent. What ore has thus far been produced was treated at the Silver Bow mill, where its average pulp assay was 46 ounces in silver. The terms of the transaction are, that in consideration of a deed for a one-half interest in the property, the Baltimore men agree to build and equip a 15-stamp mill, the whole to be afterwards capitalized, and the stock equally divided between the parties to the deal. The contract for the erection of the mill was let to day to Tuttle & Co., of this city, and the work of construction will at once begin before late in the fall. It is designed by the company to abandon temporarily the old workings of the mine, and to start a new shaft without delay.

MADISON COUNTY.—*Inter-Mountain*, August 21: We understand that the Alder Gulch C. M. company are about to try the experiment of working the black sand tailings from their flume in the mill of the Virginia City Reduction company. The result will be watched with interest by placer mine owners. The Ramshorn mining district is one of the promising localities that bid fair to become a leading center of mining industry in Madison county. Considerable work is being done in the leads of that section, and some new prospects have been discovered that promised to be very valuable. It is reported that the Pacific mine, in Brown's gulch, will be purchased by Mr. F. J. P. Pascoe, who has been here some time looking after his quartz interests in Madison county, and viewing the country in behalf of Utah capitalists. He has been spending some time in the Brown's gulch district, and expresses a high opinion of several of the quartz lodes there. It is understood that, in the event of purchase, Mr. Pascoe intends building a smelter on one of the neighboring creeks at an early day. In the Meadow Creek mining district, Martin Peel is building an arastra, and the claim owners are starting in to prospect and develop their mines. Richter & Co. are tunneling the Grand Central, and others are preparing to thoroughly test the extent and value of their property. Roads will be built to the mines, so as to make them accessible next winter.

NEW MEXICO.

GOLD GULCH.—Cor. Silver City *Enterprise*, Aug. 15: Considering the warm weather, there is much being done towards illustrating the fact that this camp abounds in silver. Almost every claim is being worked and everybody is looking as if they expected to become Goulds and Vanderbilts. The Sam Augustine mine is being worked by two shifts. The owners of the Young Man mine are pushing forward development work as fast as possible for them to do so. They propose in a short time to put on a force of men to the number of about twenty-five, to get out ore for shipping purposes. Work is being done in three places, and in every place so developed there are showings of native chloride, bromide and ruby silver. J. B. Malone, from whom the camp takes its name, is sinking on the Donohoe claim, and is taking out rock averaging $200 per ton.

CANYON CITY.—*Enterprise*, Aug. 21: Canyon City is the name given to the camp at the Cooney mine, about 8 miles from Alma on Mineral creek. The town is well named as it is located in one of the deepest and grandest canyons in New Mexico. The camp has been established several years, but until within the last few weeks has shown no building activity to speak of. Since the Cooney mine is turning out so handsomely and the probability that the company will erect extensive works, the camp seems to have taken a new lease of life and buildings are springing up as if by magic.

UTAH.

REVIEW.—*Tribune*, Aug. 22: The week has been one of fair activity in the metals. It has been cool, and rather stormy. The receipts of bullion and ore in Salt Lake City for the week ending August 20th, inclusive, were as follows: Bullion, $130,588.69; ore, $9,300; total, $139,888,69. For the previous week the receipts were $113,705.42 of bullion and $11,000 of ore. The Crescent shipped in three lots of ore valued at $9,300. Its improvements are making now with vigor, to prepare for safe and convenient handling of ore when the winter weather comes. The Tintic M. & M. Co. have again resumed shipments, we are glad to say. The result this week is two bars, of the value of $55,000. The product of the Hanauer smelter for the week was eleven cars of bullion, $16,015.

WASHINGTON TERRITORY.

RICH STRIKE.—*Kittitas Localizer*, Aug. 21: Various rumors have been set afloat as to valuable discoveries having been made in the Cle-el-um mining district. The Centennial and the Bullion lodes have both been highly prized, and are still favorites among the claimant; but the task of unearthing the mother-lode seems to have been reserved for Henry Livingston and F. D. Schneby to make. The evidence of this is found in the specimens of half galena and silver quartz they brought down several days ago from the Cle-el-um mining district. No assays of this valuable mine have yet been received. A number of the disappointed men who flocked to the Conrd'Alene mines last spring have turned up in the Similkameen mines—dead-broke of course. The output of coal in the Cle-el-um mines since the coal has been introduced into this valley is largely increasing. The blacksmiths are arranging for a winter's supply; and coal stoves are now talked of in which to utilize it for warming purposes.

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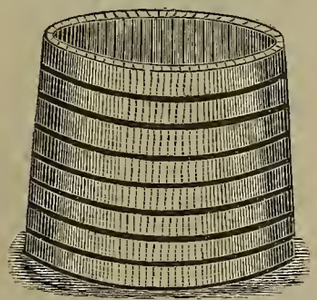

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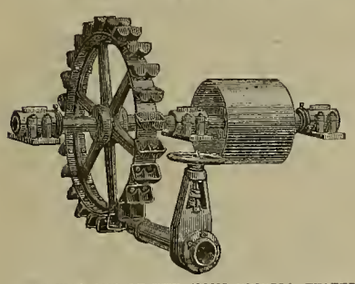

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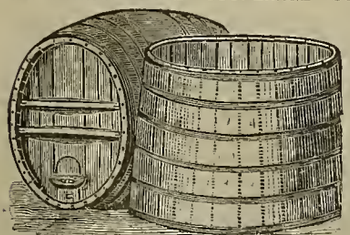

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CLEVELAND OHIO

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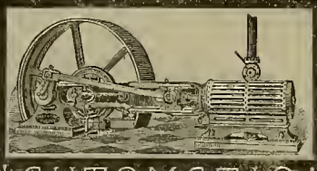

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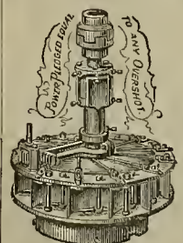
With Important Improvements, making it the



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Mining Share Market.

The market has been rather slow during the past week, though in some cases fluctuations have been somewhat marked. On the Comstock the deep winze below the 3200 in Mexican has yet about 18 feet to reach the 3300 level. Porphyry is taking the place of the bastard quartz heretofore predominant in this winze. Below this quartz it is expected will be found the genuine and fertile quartz that was seen to the west on the levels above. To reach this, however, it will be necessary to cross-cut west on the 3300 level. The west drift on the 500 level of the Ophir is now being pushed ahead at the rate of about 70 feet per week. The drift will tap ground in the old upper levels that is expected to yield a large amount of low-grade ore. The west drift on the 2800 level of the Chollar still continues in quartz that is of good appearance and which carries some metal. The great body of quartz found in this mine and in the Hale and Norcross is a most encouraging feature. Quartz is the mother of gold and silver, and the larger the body the larger the bonanza. There is no hope of a larger body of ore on a little starved quartz stringer.

Bullion Shipments.

Reed & Hillary, August 23, $2,800; Old Henry, 23, $1,500; Placer, 23, $600; Bismark, 23, $6,549; Cuba, 23, $2,600; Bonanza King, 23, $11,250; Argus, 16, $5,471; Monitor, 15, $13,782; Horn Silver, 20, $12,000; Hanauer, 20, $3,400; Stormont, 20, $3,000; Horn Silver, 21, $12,000; Ontario, 21, $9,114; Horn Silver, 22, $6,000; Ontario, 22, $2,895; Hanauer, 23, $5,200; Crescent, 23, $3,700; Horn Silver, 23, $12,000; Ontario, 23, $8,691. The banks of Salt Lake City report the receipts for the week ending August 20th, inclusive, of $130,588.69 in bullion and $9,300 in ore; a total of $139,888.69.

Secure the Reduced Rate.

After the first of April, 1884, we announced a reduction of the price of the MINING AND SCIENTIFIC PRESS from $4 to $3 a year to all who would settle up arrearages at old rates and pay *in advance* thereafter. There are some who have not yet taken advantage of this offer, and we would therefore urge all subscribers still in arrears to remit what is due us to this date, at the rate of $4 a year, and pay in advance for another term at the reduced rates for new subscriptions paid in advance.

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, August 21, 1884

ANTIMONY Per pound	- @
Haller's	13 @
Cookson's	14 @
BORAX—Refined	8½@ 8½
IRON—Glengarnock ton	24 50 @ —
Eglinton, ton	23 50 @ —
American Soft, ton	27 00 @ —
Oregon Pig, ton	- @ —
Clipper Cap, Nos. 1 to 4	30 00 @32 50
Clay Lane White	22 50 @ —
Shotts, No. 1	26 00 @ —
Refined Bar	3½@ 3
Boiler, 1 to 4	5 00 @ 5 50
Plate, 5 to 10	4½@ 4½
Nail Rod	7½@ —
Norway, according to thickness	6½@ 7½
STEEL—English, lb	15 @ 25
Black Diamond, ordinary sizes	14 @ —
Drill	15 @ —
Machinery	12 @ 14
COPPER—Ingot	15 @ —
Braziers' sizes	50 @ 25
Fire-box sheets	38 @ 37
Bolt	23 @ —
Old	12½@ 15
Bar	@ —
Cement, 100 lbs	12 @ —
Copper in New York, Aug. 27	13½@ 13½
LEAD—Pig	4½@ —
Bar	5½@ —
Pipe	7 @ —
Sheet	8 @ —
Shot, discount 10% on 500 bags; Drop, ₱ bag	2 00 @ —
Buck, ₱ bag	2 20 @ —
Chilled, do	2 40 @ —
TIN PLATES—Charcoal	7 00 @ 7 25
Coke	5 75 @ 6 75
Pig	28 75 @ —
Banca tin	32 @ 33
I. C. Charcoal R. oofing, 14x20	6 25 @ 6 50
ZINC—By the cask	10 @ —
Sheet, 7x3 ft, 7 to 10 lbs, less the cask	9 @ 10
QUICKSILVER—By the flask	30 00 @ —
Flasks, new	1 05 @ —
Flasks, old	85 @ —

OPTICAL SCIENCE.—Physiological optics, a progressive science, constantly presents new problems to scientists. Spectacles were originally made up in sets for fixed ages, and specific power, named after the manufacturer; later on they were numbered by inches; and now superseded by the metrical system divided in dioptrics, the result is much more accurate, and mathematical precision also gradually depriving those who merely engage in the sale of glasses as an article of merchandise, from finding it a profitable investment to be obtained from practical and scientific oculists and opticians. Spectacle lenses undoubtedly formed the basis for the telescope and microscope, and physiological dioptrics, as optical instruments, highly valued by men of science.—C. MÜLLER, Optician. 6

MR. G. W. INGALLS is at present representing this paper in Arizona. We hope that our friends and others who desire to give as much publicity as possible to the resources of that Territory will aid him as much as they can in gathering information. Mr. Ingalls is authorized to receive subscriptions and advertisements.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT SALE.	SECRETARY.	PLACE OF BUSINESS
Arnold G & S M Co	Arizona	2	50	Aug 1	Sept 2	A Judson	320 Sansome st
Alpha Con M Co	Nevada	18	50	July 16	Aug 21	W Willis	309 Montgomery st
Alaska M and M Co	Alaska	7	1,00	July 22	Aug 26	E F Stone	306 Pine st
Alta S M Co	Nevada	30	50	Aug 21	Sept 25	Oct 15	W H Watson	302 Montgomery st
Boracic Acid M Co	California	3	05	July 21	Aug 25	Sept 15	H C Droger	309 Montgomery st
Best & Belcher M Co	Nevada	30	50	July 9	Aug 14	Sept 2	W Willis	309 Montgomery st
Benton Con M Co	Nevada	13	25	July 22	Aug 26	Sept 15	W H Watson	302 Montgomery st
California M Co	Nevada	13	20	Aug 4	Sept 11	Oct 8	C P Gordon	309 Montgomery st
Caborca M Co	Mexico	9	05	July 18	Aug 22	Sept 22	H C Edgerly	328 Montgomery st
Con Amador M Co	California	7	50	July 21	Aug 21	Sept 10	F E Latham	408 California st
Chollar M Co	Nevada	14	50	July 23	Aug 26	Sept 15	C L McCoy	302 Montgomery st
Champion M Co	California	16	10	Aug 22	Sept 26	Oct 16	T Wetzel	522 Montgomery st
Kintrachi Gravel M Co	California	16	05	Aug 26	Sept 1	Oct 18	H Kinz	209 Sansome st
El Dorado South Con M Co	Nevada	14	2,00	July 14	Aug 14	Sept 4	D M Kent	330 Pine st
Equitable Tunnel M Co	Utah	30	30	July 29	Sept 15	Oct 7	W A Van Bokkelen	419 California st
El Dorado Con M Co	Nevada	3	04	Aug 16	Sept 15	Oct 8	A H Segre	330 Pine st
Enterprise M Co	California	1	15	July 1	Aug 15	Sept 5	W Van Bokke'en	419 California st
Golden Fleece G M Co	California	33	1,50	00 Aug 6	Sept 10	Sept 27	F Schernier	412 Sixth st
Humboldt Hill M & M Co	California	1	15	July 15	Aug 19	Sept 5	J Stadtfeld	419 California st
Martin White M Co	Nevada	18	25	July 25	Sept 4	Oct 2	J Scoville	309 Montgomery st
Mayflower Gravel M Co	California	25	10	July 10	Aug 13	Sept 5	J Morizo	328 Montgomery st
Mono G M Co	California	21	50	July 8	Aug 12	Sept 1	G W Sessions	309 Montgomery st
Morgan M Co	California	11	1,00	July 3	Aug 30	Sept 22	C S Neal	309 Montgomery st
New York Hill M Co	California	8	20	July 29	Sept 2	Sept 23	B Lightner	527 Clay st
Oleta M Co	California	1	4e	July 26	Aug 30	Sept 20	T H Ganeard	9th and Market st
Pittsburg M Co	California	10	05	July 11	Aug 15	Sept 5	G Brooks	210 Front st
Potosi M Co	Nevada	16	50	July 29	Sept 2	Sept 23	C L McCoy	309 Montgomery st
Summers Con M Co	California	1	03	Aug 18	Sept 22	Oct 15	F E Latty	330 Pine st
Summit M Co	California	7	05	Aug 4	Sept 3	Sept 22	G W Sessions	309 Montgomery st
Santa Anita M Co	California	7	02	July 30	Sept 2	Sept 22	J M Buffington	306 California st
Utah S M Co	Nevada	50	50	Aug 18	Sept 22	Oct 11	G C Pratt	309 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Alaska M Co	California	A Judson	320 Sansome st	Annual	Sept 2
Arnold M Co	California	A Judson	320 Sansome st	Annual	Sept 2
Day S M Co	Nevada	E M Hall	327 Pine st	Annual	Sept 16
Eureka Con M Co	Nevada	E H Wilson	323 Montgomery st	Special	Sept 5
Grand Prize M Co	Nevada	E M Hall	327 Pine st	Annual	Sept 16
Real del Castillo M Co	Mexico	A Judson	320 Sansome st	Annual	Sept 2
Villagrana M Co	Mexico	A Judson	320 Sansome st	Annual	Sept 2

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	May 15
Bodie Con M Co	California	G W Sessions	309 Montgomery st	50	June 5
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Aug 26
Idaho M Co	California			4.00	Apr 2
Jackson M Co	California	D C Bates	309 Montgomery st	10	Mar 16
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 21
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Apr 28
Standard Con M Co	California	Wm Willie	309 Montgomery st	25	Mar 25
Syndicate M Co	California	J Stadfeldt	419 California st	10	Apr 2

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug. 7.	WEEK ENDING Aug. 14	WEEK ENDING Aug. 21.	WEEK ENDING Aug. 28
Alpha	.90 1.10	1.00 1.50	1.25 1.75	1.25 1.45
Alta	1.75 2.35	1.95 2.55	1.90 2.65	2.10 2.40
Andes	.30 .40	.25 .30	.25 .30	.25
Argenta				.15 .25
Belcher	.95 1.15	1.00 1.05	.85 .95	.85 .90
Bedding				
Best & Belcher	2.15 3.05	1.75 2.85	2.25 2.55	2.20 2.35
Bullion	.60 .70	.55 .70	.55 .60	.50
Bonanza King				
Belle Isle	.50 .60	.50 .60	.55 .70	.75
Bodie Con	1.70 2.25	1.75 2.00	1.95 2.15	1.90 1.95
Benton	.30 .40	.40 .50	.35 .50	.40 .75
Bodie Tunnel				
Bulwer	.60	.60	.60	.50
California	.10 .25	.10 .10	.15	.15
Challenge		.25		.15
Champion				
Chollar	2.50 3.40	2.75 4.10	1.80 3.50	1.80 2.60
Confidence		1.00	1.00	
Con. Imperial		.05		
Con. Virginia	.25 .35	.25 .30	.25 .40	.35 .40
Con. Pacific	.50 .55	.50 .55	.50 .55	.35 .35
Crown Point	1.35 1.50	1.35 1.45	1.40 1.45	1.30 1.35
Day				
Eureka Con	2.40	2.50		
Eureka Tunnel			.50	.40 .55
Exchequer	.35 .40	.35 .45	.35 .45	.30 .40
Grand Prize	.50 .55	.60 .75	.50 .80	.50
Gould & Curry	2.00 3.10	2.20 2.50	1.90 2.30	1.50 2.05
Goodshaw				
Hale & Norcross	2.25 4.60	2.40 2.95	2.40 3.00	2.75 3.25
Holmes		2.00		2 50
Independence	.25	.25	.50	.22
Julia				
Justice	.10 .30	.20	.30	.15 .25
Martin White				
Mono	.25 .30	.60 1.75	.70 .90	.60 .70
Mexican	1.85 2.45	2.00 2.35	1.50 2.05	1.45 1.60
Mt. Diablo				2.00
Northern Belle				
Navajo	3.80 3.90	2.75 4.00	4.00 4.20	4.00 4.15
North Belle Isle			.30	.35
Occidental	1.25 1.10	1.15		1.25 1.25
Ophir	1.25 1.90	1.35 1.10	1.05 1.35	1.05 1.30
Overman	.20 .25	.15 .25	.15 .20	.15 .20
Potosi	1.25 1.75	1.45 2.15	1.00 1.85	.25 1.05
Pinal Con				
Savage	.90 1.45	.90 1.15	.90 1.05	.95 1.25
Seg. Belcher	1.75	2.00		2.00
Sierra Nevada	2.00 2.65	2.20 2.50	1.35 2.10	1.30 1.50
Silver Hill	.10			
Silver King		4.50		4.25 4.50
Scorpion	.30 .40	.30 .40	.25 .30	.25
Syndicate		.40	.40 .45	.45
Thoga				
Union Con	1.65 2.15	1.70 2.00	1.05 1.50	1.10 1.20
Utah	1.40 2.00	1.40 1.65	.75 1.25	.95
Yellow Jacket	2.05 2.20	2.00 2.15	1.95 2.00	1.75 1.90

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Aug. 28.

100	Alta	2.20	
30	Alpha	1.85	
100	Argenta	15c	
135	Bodie Con	1.80	
50	B. & Belcher	2.35	
100	Belmont	1.55	
120	Bullion	50c	60c
30	Belcher	90c	

AFTERNOON SESSION.

270	Chollar	2.70	
250	Con. Virginia	35c	
300	Con. Pacific	55c	
1580	Challenge	20c	
200	Con. Imperial	05c	
10	Confidence	1.00	
500	Exchequer	40c	
200	Gould & Curry	2.10	
900	Grand Prize	50c	
820	Hale & Nor	3.15	
200	Mono	60c	
175	Navajo	4.15	
100	Ophir	1.25	
1025	Chollar	2.60	
650	Gould & Curry	2.05	
1250	Hale & Nor	3.10	
300	Mexican	1.50	
250	Ophir	1.10	
425	Overman	15c	
3600	Potosi	1.05	
300	Sierra Nevada	1.45	
930	Savage	1.25	

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & CO.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.]

FOR WEEK ENDING AUGUST 19, 1884.

303,693.—AMALGAMATING PAN—J. A. Bidwell, Ivanpah, Cal.

303,696.—BILLIARD TABLE LEVELER—J. W. Blundon, Whatcom, W. T.

303,698.—CAR COUPLING—L. A. Branchaud, S. F.

303,811.—WAGON JACK AND TIRE TIGHTENER—W. W. Coon, Walla Walla, W. T.

303,713.—SAFETY CAR TRUCK—J. Denechaud, Sr., S. F.

303,715.—REVERSIBLE PLOW—A. H. Fitch, Santa Cruz.

303,723.—HAND PIECE FOR DENTAL ENGINES—Grace & Miller, S. F.

303,734.—GRAIN SCOURER—John C. Hunt, Chico, Cal.

303,738.—TWO WHEELED VEHICLE—F. A. Knox, Woodland, Cal.

303,654.—WINDOW BEAD FASTENER—D. C. McGregor, East Oakland, Cal.

303,742.—MOP-WRINGER—W. F. Mills, Oakland, Cal.

303,761.—MECHANISM FOR BALANCING AND SUPPORTING MILLSTONES—Geo. Simmerlon, S. F.

303,780.—REVOLVING HARROW—J. D. Winters, Davisville, Cal.

NOTE. Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

PIPE, JOINT AND COUPLING.—John C. Kittou, S. F., assignor of one-half to J. O. B. Gunn. No. 402,343. Dated July 22, 1884. This pipe joint and coupling is specially useful where gases or vapors are to be conveyed under pressure. It consists of a coupling-sleeve having screw threads cut at one or both ends, and a permanent collar or collars formed within the sleeve, just inside the screw threads, secured by glands or followers which surround the pipes and screw into the sleeves. The pipes may have a collar and packing, against which the sleeve presses to hold them and make a tight joint, or the outer end of the gland may be conical-split, and threaded to receive a nut which closes it, so as to clamp and hold the pipe. In coupling pipes for ice-machines or other places where gas or vapor is passed through them under high pressure, it has been customary to cut a thread upon the exterior of the pipe end, and screw it into a coupling nut with packing to make the joint tight. This plan is open to the objection that the pipe is much weakened by cutting the screw thread and is liable to be ruptured at that point. The new form of coupling obviates this difficulty.

CONSTRUCTION OF BUILDINGS.—Peter H. Jackson, S. F. No. 302,338. Dated July 22, 1884. This consists of a novel arrangement and construction of parts, to accommodate the different constructions in front of a building. In making buildings it is often necessary to illuminate certain portions of the basement or vault formed underneath the sidewalk by glazed portions of the same, while other portions are supported by brick arches. Mr. Jackson has the beam-riser forming the offset between the cover of the area way and the sidewalk, with outwardly projecting flanges at the bottom to support a sidewalk, the said riser having a vertical web of different depths, so that illuminating tile or brick arches may be supported from the flanges and the surfaces be level or continuous. He also combines with the beam-riser a supplemental beam support extending parallel with and behind the riser, and having intermedial connecting and supporting brackets. Compression rods extend back from the beam or riser to the floor timbers.

HAND BLOWER.—George Cumming, S. F. No. 301,967. Dated July 15, 1884. It consists in the application of toothed gearing from the crank shaft, or point of application of the power employed through a train of toothed gear wheels to the shaft which carries the fan of the collection, and casing in of all the working parts of the apparatus, so that they are not exposed or widely separated; in a pin and means for keeping the casing, holding the gears in its proper place, and of steel buttons on the ends or extremities of the bearings of the gear spindles, in order to keep the gears in their proper longitudinal position, and take up end-play. Hand blowers now in general use are driven by a crank or lever; but before the power is applied to the shaft carrying the fan; it is transmitted through belts, bands, woven or friction gears, the fan and its casing being capable of separation from the rest of the parts of the blower. The driving apparatus being connected by belts, bands, etc., is likewise separated, and also exposed. In Mr. Cumming's invention, the fan and driving mechanism are contained in a case of peculiar construction, all the driving parts being protected without interfering with the free ingress of air to the fan.

STEAM ENGINE.—John P. Pritchford, S. F. No. 302,636. Dated July 29, 1884. This invention relates to certain improvements in that class of steam engines having independent rotary steam and exhaust valves, and it consists of certain improvements in the rotary valves and the parts by which the steam is admitted to the cylinder and exhausted therefrom, of a means for driving said valves, and of certain improvements in the cylinder and cylinder-heads within which the valves operate, and the steam and exhaust passages. In large engines the amount of machine work upon the cylinder is a matter of considerable expense; but on the engine the most of this work is done upon the heads, which, being comparatively small, are more easily handled, and from their shape are more easily adapted to machines which will do the required work. If a valve becomes deranged or needs repairs, it may easily be removed without disturbing the remainder of the machinery, or it can be disengaged from the ditch device which forms part of the invention.

SHEEP SHEARS.—S. D. Paxton, D. E. Paxton and Amos Mahurin, Usiah, Meudocino Co. No. 302,354. Dated July 22, 1884. The invention is in that class of sheep shears in which the blades are held apart under the influence of a spring, against which the pressure of the hand is exerted to close them. It consists in a novel hinge-connection between the shanks and blades; in a peculiar spring, under the influence of which the blades are opened; in a stop or catch which limits their separation when operating; and in removable blades, whereby they may be readily removed in case of an accident or fault in either, requiring the substitution of another. The object of the invention is to provide shears which, on account of their formation, will be superior so those now in use in durability and ease of operation, closing with less force and reacting quicker, firm in handling and precise and strong in use, and easily repaired and kept in order.

GRAIN DRILLS.—Calvin G. Hampton, Turlock, Stanislaus Co., Cal. No. 303,153. Dated Aug. 5, 1884. This invention relates to that class of seeding implements or grain drills in which the seed is conducted from a hopper or seed-box through an intermediate conveyor to the drill-tube. The invention consists in novel means for feeding the seed from the hopper accurately and definitely, and in certain improvements in arranging and combining the various conveyors and drill-tubes, whereby all the necessary adjustments and the yielding of the drills can be accomplished without disturbing the relation or communication of the parts. There are certain details of construction covered by the patent. To effect the operation, the object is to provide a grain drill which can be easily handled, effective in operation, and not likely to get out of order or become disarranged in any of its parts while in use.

HARROW.—William A. Howard, Dixon, Solano Co., Cal. No. 303,223. Dated Aug. 5, 1884. These improvements patented consists in a wheeled platform carrying a seat; in a novel connection between the platform and the harrow-sections, whereby the latter may be raised; in a mechanism for cleaning the harrow teeth; in the hinge or joint between the evener and the sections, and in a peculiarly adjustable draft.

Iron and Concrete Construction.

(*Continued from page 133.*)

axis seeking extension, and all above compression. How slight are the *duties* of the *web* of a *beam* under these circumstances may be seen from the exceeding thinness to which it is possible to reduce it, which fact seems to confirm the view that the web of a beam possesses cohesive power sufficient to resist the shearing strains resulting from a bending stress; it is equal to all the duties required of it, all other strains upon it being secondary and inferior.

It is not difficult to understand how a metal tie is held in the embrace of a concrete web, nor how a web of concrete four or five times as thick as metal webs are usually made, should be quite able to perform its part and become equally serviceable.

A flat tie as is exhibited in Figs. 26, 28 and 30, plate *J*, [omitted—ED. PRESS] on account of the large holding surface presented for the concrete as on that of the bottom flange of the rolled beam dwelt on in the fore part of this, in Fig. 1, is probably the best form in which iron can be used.

When placed edgewise, as in Figures 15, 16, 17, 18 and 19, the illuminating tile, plate *K*, seems to be the most convenient tie that can be employed; the wires that connect the bars, called the gridiron tie, serve as stopes to prevent the metal sliding when the beam is under strain. This evidences that the tie becomes attached to the web practically throughout its entire length, and as firmly at one point as at another.

The Formula for Computing the Strength

Of this Portland cement concrete beam, providing the ties are all a sufficient distance below the neutral axis, should be as in that for computing the strength of a wrought iron plate girder. With the latter we first proportion the top and bottom flanges in metal quantities, correspondingly to their resisting power to compression and extension. Wrought iron being about 35 per cent the weaker in resisting compression, much more metal must be in the compressive member than in the tensile one. After proportioning the beam no more attention is given to the part subject to compression, but only to ascertain the section of the bottom flange subject to extension, and the depth of the beam; and as our tensile member in the Portland cement concrete combined with iron is of wrought iron, and is held to the web and exercised in the same way as in that of the plate girder, and all other parts are in the same relationship, the constant must be the same. Therefore, after the concrete beam is proportioned to have sufficient concrete material for compressive strength to balance the tensile capacity of the ties held in place, and at a sufficient distance below the neutral axis, then we proceed as in that of the wrought iron girder after the parts of it are balanced in their respective resistances.

First, for a numerator multiply the sectional area of the iron tie bars, deducting for holes, by the depth to be from the center of the tie bars to the top of the beam, and multiply the product by the constant of 80, as in the formula of the wrought iron girder.

For the denominator take the number of inches between the supports; the quotient will be the breaking load in tons in the center of the beam. All parts performing their respective duties is equally applicable in this composite construction as in that of the wrought-iron girder.

It is the basis in supporting power serviceable in so many applications in buildings and other constructions, as supporting walls for floors, slabs, sidewalks, beams, girders, etc.

No. 2, shown at the bottom of plate *G*, was a

Beam of Concrete Without Iron,

And broke at 1,484 pounds; and, taken as a unit in contrast with the following, that were tensilely strengthened by iron ties, as shown in plates *G* and *J*.:

No. 19, plate *A*, had 21 pounds of iron, which increased its strength 11½ times of the plain concrete beam (No. 2 in plate *G*, and computed by the formula given), broke at 1 per cent in excess of formula.

These tie bars were kept at a proper distance below the neutral axis which was not the case with the others; had the tie bars been a greater distance below the neutral axis undoubtedly better proportionate results would have been attained.

Plate *G*.
- No. 15 had 62 lbs. of iron which increased its strength.....17 times.
- No. 16 had 52 lbs. of iron which increased its strength.....17-1-10ths times.

Plate *J*.
- No. 17 had 44 lbs. of iron which increased its strength.....16 times.
- No. 18 had 31 lbs. of iron which increased its strength.....14 3-10ths times.
- No. 19 had 21 lbs. of iron which increased its strength.....11½ times.

No. 26 had 31 lbs. of iron (flat ties) which increased its strength.
No. 28 had 35 lbs. of iron (flat ties) which increased its strength.
No. 30 had 40 lbs. of iron (flat ties) which increased its strength.

With these three latter being four inches greater in depth could not compare results with No. 2.

In all cases the iron ties broke, and were finally held in the concrete body in the manner that a bottom flange of an iron beam is held to its web.

In San Francisco, Nov. 3, 1883, at No. 231 First street, a

Portland Cement Illuminating Tile,

Combined with iron ties, as shown on plate *K* was tested, but being only 20 days old, was not old enough for great strength, but was still in excess at that green age of the heaviest cast iron illuminating tile ¾ of an inch thick and tested centrally in the same way, which broke at 2,105 pounds, while the new cement tile broke at 2,171 pounds. Both of these tests were witnessed by H. Hanstein, Jas. B. Lane and L. Girolt.

On Nov. 23, 1883, at the same place, a trial was made of the same size Portland Cement Illuminating Tile about 40 days' old, as shown in plate *K*, and the fractured tile presented, of which Fig. 1 is the top, and Fig. 2 the bottom. Fig. 3 is a cross section, and Fig. 4 shows the iron ties, five in number, 1×⅛ of an inch flat iron, threaded on ten 3-32 of an inch steel wires subsequently, 3 16 of an inch iron wires were used—total weight of iron and steel 3¼ pounds, tested by an octagon steel bar of one inch in diameter, presenting a half inch surface bearing centrally across the tile.

At	1376	pounds deflection united,		5-32	inch.
"	1543	"	"	7 64	"
"	1717	"	"	1 8	"
"	1908	"	"	3-32	"
"	2017	"	"	3-16	"
"	2150	"	"	13-64	"
"	2230	"	"	1 4	"
"	2405	"	"	9 32	"
"	2600	"	"	3 8	"
"	2716	"	"	29 64	"
"	2750	"	broke.		

Witnessed by Mr. John Wright, Mr. G. W. Percy and Mr. W. P. Moore, architects, of San Francisco.

The Portland cement, combined with iron illuminating tile 1¼ inches thick, bore 635 pounds more than the heaviest cast-iron illuminating tile used over areas ¾ inch thick, both tested in the same manner.

A trial was made at the Industrial Iron Works, on Beale street, San Francisco, January 19, 1884, of a Portland cement concrete slab, with iron, such as will be used for sidewalks and floors, dispensing with supporting arches. It was 3 inches in thickness, and 4 feet 6 inches square—20 feet 3 inches, resting on two end supports, each 3 inches, leaving the distance between supports 4 feet, and by 4 feet 6 inches—area 18 feet.

The ties consisted of 19 1-inch wide by ¼-inch thick bars, placed 2½ inches centres, and threaded on 9 ½-inch diameter iron rods, placed 6 inches centres; total weight of iron, 41 pounds.

The top of the flat bars were 1½ inches below the top of slab. Age of slab, 62 days.

This was tested in the presence of Mr. G. W. Percy and Mr. John Wright, architects, as follows: Loaded with—

18,234 lbs. pig iron deflected 9-32 of 1 in. or 900 lbs. ⅟ ft.
21,111 lbs. pig iron deflected 5-16 of 1 in. or 1,042 lbs. ⅟ ft.
24,146 lbs. pig iron deflected 3-8 of 1 in. or 1,192 lbs. ⅟ ft.
26,885 lbs. pig iron deflected 7-16 of 1 in. or 1,328 lbs. ⅟ ft.
29,344 lbs. pig iron deflected 1-2 of 1 in. or 1,450 lbs. ⅟ ft.
32,747 lbs. pig iron deflected 9-16 of 1 in. or 1,617 lbs. ⅟ ft.
35,006 lbs. pig iron deflected 5-8 of 1 in. or 1,725 lbs. ⅟ ft.
36,375 broke at 1,797 lbs. per ft.

At 32,747 pounds, or 1,617 pounds per foot and 9-16 deflection, a small crack was first observed.

The question was asked as to the stability of this construction to resist impact.

The speaker said that when the deflection caused by force of impact was within a certain safe limit of the elastic force of the material, it is equally as serviceable as in other substantial constructions. In the computation as to the safe bearing load of any construction, the most severe service it may be subjected to must be considered, so that the strain in such service is within a certain recuperative force of the material. With cast-iron beams it is safe to employ them at rest at one-third the breaking load. In this construction for sidewalks and floors, etc., I take it that one-fourth of the breaking weight will be a safe employed load.

For fire-proof walls and other surfaces and purposes, Mr. Hyatt has found that mixing a small percentage of sulphur with a body of Portland Cement, and then heated to a red heat, will stand the effects of cold water when thrown upon it.

I have made the trial with this composition, made in brick form, and when heated red hot and thrown into a pail of cold water, it retained its form nearly equal to fire-brick; while a body of neat cement of the same form and age, and by the same treatment partially dissolved like sugar when placed in the water. Mr. Hyatt has secured these combinations by two United States patents of which Mr. Jackson has the right for this coast.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

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Table of Contents:

Preface; Introduction; Implements; Assay Balances; Materials; The Assay Office; Preparation of the Ore; Weighing the Charge; Mixing and Charging; Assay Litharge; Systems of the Crucible Assay; Preliminary Assay; Dressing the Crucible Assays; Examples of Dressing; The Melting in Crucibles; Scorification; Cupellation; Weighing the Bead; Parting; Calculating the Assay; Assay of Ore Containing Coarse Metal; Assay of Roasted Ore for Solubility; To Assay a Cupel; Assay by Amalgamation; To Find the Value of a Specimen; Tests for Ores; A Few Special Minerals; Solubility of Metals; Substitutes and Expedients; Assay Tables.

The volume embraces 106 12mo. pages, with illustrations, well bound in cloth: 1881. Price, $1, postpaid. Sold by DEWEY & CO., Publishers, No. 252 Market street, San Francisco.

N B. This is Part I of three volumes on assaying by the same author. To be followed by Part II. Gold and Silver; Part III. Lead, Copper, Tin, Mercury. A majority of the best mining publications yet printed have been issued by and are for sale by DEWEY & CO., publishers of the MINING AND SCIENTIFIC PRESS, S. F.

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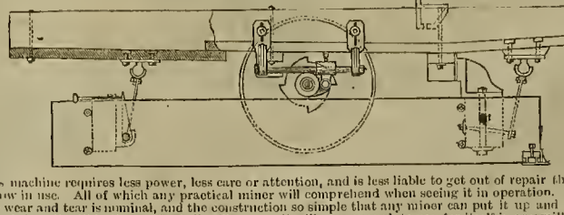

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—PATENT—
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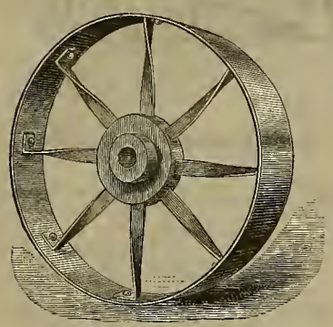

Advantages of these Pulleys.

They are less than half the weight of cast-iron pulleys; are polished on the face; are made either crowned or straight, and are turned in the lathe the same as the best make of cast-iron pulleys.

They are carefully balanced. They are subject to no contraction strains, and can be run at very high speed without danger of bursting.

On account of their great lightness and the form of the arms, they absorb less power than any other pulley.

They are *the only pulley of the kind* which runs true. They cannot be broken in transport.

TESTIMONIAL:

MATHER LANE SPINNING CO. (Limited), LEIGH, ENGLAND, Nov. 5, 1883.

N. Macbeth, Esq. —Dear Sir: The Patent Steel Pulleys supplied throughout to our No. 2 Mill are working to our entire satisfaction.

They are very true, and are about 50 per cent lighter than the cast-iron pulleys in our No. 1 mill.

Yours faithfully,
For the Mather Lane Spinning Co. (Limited),
[Signed:] RICHARD T. MARSH,
Managing Director.

Risdon Iron & Locomotive Works,

Sole Manufacturers and Agents for the Pacific Coast,

S. E. Cor. Beale & Howard Sts., San Francisco

☞ Send for Circular and Prices.

UNION IRON WORKS,

SACRAMENTO, CAL.

ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS AND ALL

Kinds of Machinery for Mining Purposes.

uring Mills, Saw Mills and Quartz Mills Machinery constructed, fitted up and repaired.

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Golden State & Miners Iron Works.

Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.

STEVENSON'S PATENT

Mold-Board AMALGAMATORS,

Golden State Pressure Blowers.

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California Brass Foundry,

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All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rubber Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. ☞PRICES MODERATE.☜

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THOMAS THOMPSON. THORNTON THOMPSON

THOMPSON BROTHERS,

EUREKA FOUNDRY,

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MANUFACTURERS OF CASTINGS OF EVERY DESCRIPTION.

California Machine Works,

WM. H. BIRCH,

Engineer and Machinist,

119 Beale Street, San Francisco.

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Steam Engines, Flour Mill, Mining, Saw Mill and Dredging Machines
Brodie Rock Crushers,
Steam Power, Hydraulic, Side Walk and Hand-Power ELEVATORS.

Manufacturers of B. E. Henrickson's Patent Automatic Safety Catches for Elevators. All kinds of machinery made and repaired. ☞ORDERS SOLICITED.

COKE. PATENT. COKE.

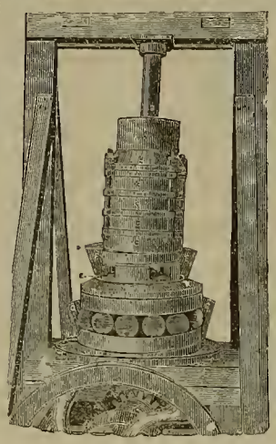
This COKE is exclusively used by Prof. Thomas Price, in his assay office, by the Selby Smelting and Lead Co., Prescott, Scott & Co., Risdon Iron and Locomotive Works and others in this city. Large supplies are regularly forwarded to consumers in Salt Lake and Nevada, to the Copper Queen Mining Co., Longfellow Copper Mining Co. and other consumers in Arizona.

The undersigned are in receipt of regular supplies from Cardiff, Wales, and offer the COKE for sale in quantities to suit purchasers.

BALFOUR, GUTHRIE & CO.,
316 California St., San Francisco.

F. P. BACON, PRESIDENT C. L. FOUTS, SECRETARY

THE GLOBE IRON WORKS COMPANY



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— AND BUILDERS OF —

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Portable, Stationary and Marine Engines

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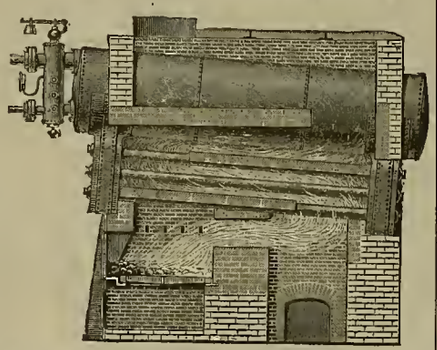
HEINE PATENT SAFETY BOILER,

RISDON IRON AND LOCOMOTIVE WORKS.

Sole Agents for the Pacific Coast, - Corner Beale and Howard Sts., San Francisco.

Economy in space and fuel. Safety at high pressures. Freedom from scaling. Equally adapted for power and heating purposes. Especially adapted for mills, factories, hotels, stores or any place where safety is a necessity. Will work well with muddy water and any kind of fuel.



TESTIMONIALS.

ST. LOUIS, MO., Sept. 26, 1883

Messrs. Adolphus Meier & Co. GENTLEMEN: We cheerfully certify that the "*Heine Patent Safety Boiler*" put up by you in our establishment has proved very satisfactory in its working. The chief points of excellence in the "Heine Safety Boiler" are its economy in fuel and space, freedom from scaling, aptitude for power and heating purposes, working equally well with clear and muddy water. We warmly recommend it to all using steam machinery. Yours truly,

ANHEUSER-BUSCH BREWING ASS'N.

OFFICE OF SUP'T OF ROYAL RAILWAYS, BERLIN, Sept. 23, 1883

To Mr. H. Heine, Civil Engineer: In reply to your inquiry of September 24, we respectfully inform you that the three boilers built under your patents, under steam since September 25, 1881, at the Alexander Place Depot, as well as the two at Friedrich Strasse Depot, under steam since September 22, 1882, have given good satisfaction, requiring no repairs whatsoever to date. The internal cleaning of the boiler was always accomplished with ease on account of the convenient arrangement of the tube caps, the adhesion of scales being fully prevented thereby, and the boilers kept in prime condition.

(Signed): BRAUCKE.

Send for Circular and Prices.

WM. HAWKINS,

MACHINE WORKS,

225 and 227 BEALE STREET,

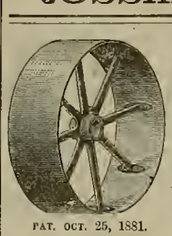
Between Howard and Folsom, - - - - San Francisco, Cal.

.....MANUFACTURER OF.....

ALL KINDS OF MACHINERY.

PORTABLE HOISTING ENGINES FOR MINES A SPECIALTY.

Jobbing Promptly Attended to.



PAT. OCT. 25, 1881.

PERFECT PULLEYS

Clot & Meese,

Sole Licensed Manufacturers of the

Medart Patent Wrought Rim Pulley

For the States of California, Oregon and Nevada, and the Territories of Idaho, Washington Montana, Wyoming, Utah and Arizona. Lightest, Strongest, Cheapest and Best Balanced Pulley in the World. Also Manufacturers of

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CHILLED CAR WHEELS.

Medal Awarded, Mechanics' Fair, 1882.

STEIGER & KERR, Occidental Foundry,

No. 137 FIRST STREET, SAN FRANCISCO, CAL.

☞IRON CASTINGS OF ALL DESCRIPTIONS.

WATER JACKET SMELTING FURNACES

—FOR—

Galena Silver & Copper Ores.

The PACIFIC WATER JACKET SMELTERS embrace many features that are entirely new and of great practical utility, which are covered by letters patent.

No other furnaces can compare with these for durability and in capacity for uninterrupted work.

MORE THAN ONE HUNDRED of them are now running on the Pacific Coast, giving results never before obtained as regards continuous running, economy of fuel, grade and quality of bullion produced. We are prepared to demonstrate by facts the claims here made.

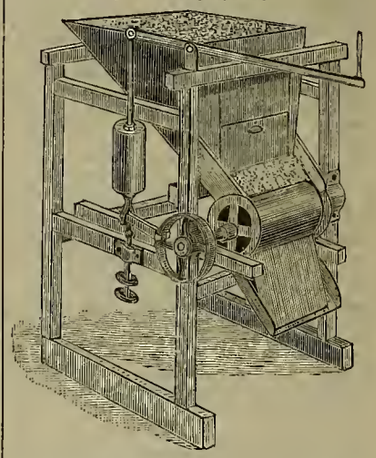
These Smelters are shipped in a complete state, requiring no brick or stone work, except that for the crucible, thus saving great expense and loss of time in construction.

Complete smelting plants made to order of any capacity and with all the improvements that experience has suggested as valuable in this class of machinery. Skilled and experienced smelters furnished when desired to superintend construction and running of furnaces. Estimates given upon application. Send for circular.

RANKIN, BRAYTON & CO.,
Pacific Iron Works, San Francisco. Chicago and New York.

THE ROLLER ORE FEEDER

[Patented May 28, 1882.]



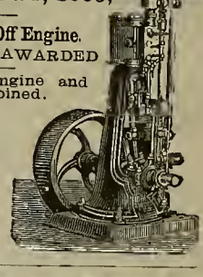
This is the best and cheapest Ore Feeder now in use.

It has fewer parts, requires less power, is simpler in adjustment than any other. Feeds coarse ore or soft clay alike uniformly, under one or all the stamps in a battery, as required.

In the Bunker Hill Mill it has run continuously for two years, never having been out of order or costing a dollar for repairs.

Golden State and Miners' Iron Works,
Sole Manufacturers,
237 First Street, SAN FRANCISCO, CAL

GOLD MEDAL AWARDED
— AT —
Mechanics' Fair, 1883,
— FOR —
Automatic Cut-Off Engine.
SILVER MEDAL AWARDED
— FOR —
Best Hoisting Engine and Boiler Combined.

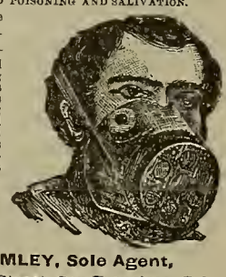


W. H. OHMEN,
Machine and Engine Works,
109 & 111 Beale St.
SAN FRANCISCO.

Patent Life-Saving Respirator.

PREVENTS LEAD POISONING AND SALIVATION.

Invaluable to those engaged in dry crushing quartz mills, quicksilver mines, white lead corroding, feeding thrashing machines and all occupations where the surrounding atmosphere is filled with dust, obnoxious smells or poisonous vapors. The Respirators are sold subject to approval after trial, and, if not satisfactory, the price will be refunded.



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H. H. BROMLEY, Sole Agent,
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SURVEYORS—INVENTORS.

A. SCHURCH, Mathematical Instrument and Model Maker, 335 Bush street, S. F. Scientific Apparatus and Experimental Machinery at short notice.

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PARKE & LACY,

Putnam Engine Lathe.

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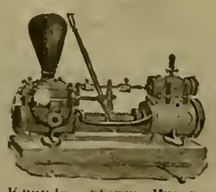

Knowles Steam Pumps
The Standard.

Nos. 21 and 23 FREMONT STREET. SAN FRANCISCO. CAL.

Mining Machinery, Steam Pumps, Wood and Iron Working Machinery,

ENGINES and BOILERS.

SOLE AGENTS FOR

Burleigh Rock Drills and Air Compressors,
Putnam Machine Tools,
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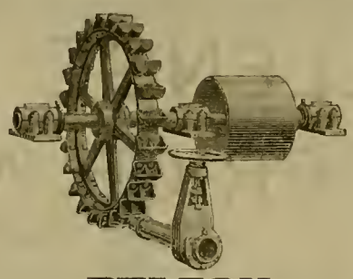
Knowles Steam Pumps for any service,
Valley Machine Company's Bucket Plunger Pumps,
Heald & Sisco's Centrifugal Pumps,
Jessop & Son's English Cast Steel,
Hazard Manufacturing Co.'s Wire Rope.

SEND FOR CIRCULARS.



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Novelty Iron Works' Shingle Machinery,
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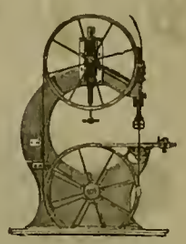
Hancock Inspirators,
Harrington's Screw Hoisting Machines,
Leffel Double Turbine Water Wheel,
Pelton's Hurdy-Gurdy Water Wheel,
Babcock Fire Extingusihers and Chemical Engines.



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MANUFACTURERS OF

WIRE ROPE, Flat and Round, of the best material and workmanship. Large Stock always on hand. Special sizes made to order.

WIRE Of all kinds for Telegraph and Telephone purposes, Baling Hay, and all purposes that wire can be put to. Brass and Copper—Galvanized. Annealed, Bright and Coppered Wire.

☞ ASK YOUR DEALER FOR ☜

PACIFIC WIRE.

TRADE MARK.

Barbed Wire. Sole Licensees on the Pacific Coast for the manufacture of Barbed Wire, Two and Four Point Wire and Flat Barbs.

WIRE CLOTH. Brass, Copper and Steel, all kinds, and meshes from 1 to 10,000 to the square inch.

WIRE FENCING Of various designs for Stores, Banks, Asylums, Gardens, etc.

WIRE GUARDS For the protection of Windows, Skylights, Prisons, etc., etc.

WIRE RAILINGS For House Fronts, Window Sills, Stores, Public Squares, etc.

WROUGHT IRON Railing, Fencing, Crestings, Entrance Gates, and Ornamental Work.

Anything in Wire or Light Wrought Iron, Ornamental or Useful,

Go to the CALIFORNIA WIRE WORKS,

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Pacific Rolling Mill Co.,

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Car and Locomotive Axles and Frames, and Hammered Iron of Every Description.

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IMPROVED PORTABLE HOISTING ENGINES

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HOME INDUSTRY! ALL WORK TESTED AND GUARANTEED!

Stationary and Compound Engines, Flour, Sugar, Quartz and Saw Mills. Amalgamating Machines.

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Sole Manufacturers of Kendall's Patent Quartz Mills.

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STEAM PUMPS TO GO IN SHAFTS.

NO ENGINES OR BELTS. NO PUMP VALVES.

PRICE OF PLANT REDUCED ONE-THIRD.

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STEAM, AIR, AND HYDRAULIC MACHINERY.

Agents of the Cameron Steam Pump.

Home Industry All Work Tested and Guaranteed.

VERTICAL ENGINES,
HORIZONTAL ENGINES,
AUTOMATIC CUT-OFF ENGINES,
COMPOUND CONDENSING ENGINES,
SHAFTING,
BABY HOISTS,
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TRY OUR MAKE. CHEAPEST AND BEST IN USE.

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Successors to PRESCOTT, SCOTT & CO.

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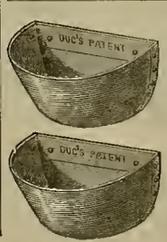

THE "DUC" STEEL BUCKET!

Always First Premium in Competitive Trials.

Extra Strong and Very Durable.

Made of Best Charcoal Iron. Only One Seam. No Corners to Catch. Runs with Least Power.

☞ BEST MINING BUCKET MADE. ☜

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PRICES GREATLY REDUCED.

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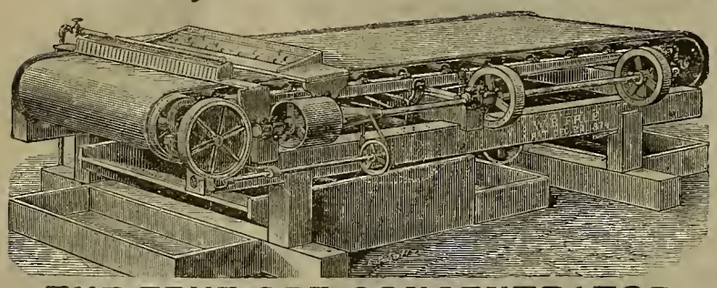
22 Cliff Street, New York.

$1,000 CHALLENGE!



THE FRUE ORE CONCENTRATOR,
OR VANNING MACHINE.

PRICE: FIVE HUNDRED AND SEVENTY-FIVE DOLLARS, ($575 00), F. O. B.

OVER 1,000 ARE NOW IN USE. Saves from 40 to 100 per cent more than any other Concentrator. Concentrations are clean from the first working. The wear and tear are merely nominal. A machine can be seen in working order and ready to make tests at the Fulton Iron Works, No. 220 Fremont Street, San Francisco.

As the result of a suit East against an End-Shake Machine (the Embrey), similar to the Triumph, the Frue Vanning Machine Company owns the Embrey patent, and can put in the market an End-Shake Machine of earlier patent that will do as good work as the Triumph, and superior in construction and durability. There will be no risk of suit for infringement.

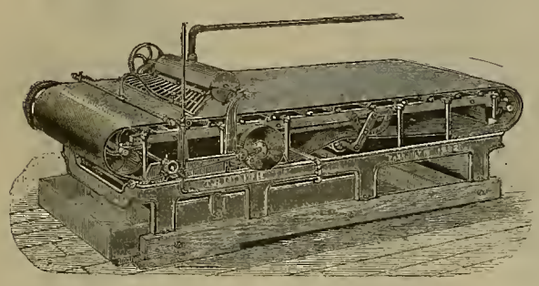
The Frue Vanning Machine Company warn the public that they claim and will prove the Triumph machine to be an infringement on patents owned by them.

Protected by patents May 4, 1869, Dec. 22, 1874, Sept. 2, 1879, April 27, 1880, March 22, 1881, Feb. 20, 1883, Sept. 18, 1883. Patents applied for.

N. B. We are and have been ready at any time to make a competitive trial against the Triumph, or any other Concentrator for stakes of $1,000.

ADAMS & CARTER, Agents Frue Vanning Machine Co.,
Room 7—No. 109 California Street, - - - SAN FRANCISCO, CAL.

$1,000 CHALLENGE ACCEPTED!



THE
"TRIUMPH" ORE CONCENTRATOR.

PRICE, FIVE HUNDRED AND FIFTY DOLLARS ($550.00), F. O. B.

THE "TRIUMPH" TRIUMPHANT!

In a competitive trial recently had between two of the "Triumph" Ore Concentrators and the same number of "Frue" Vanning Machines, at the mill of the celebrated gold producing Original Empire Mill and Mining Company, in Grass Valley, Nevada County, Cal., the "Triumphs" produced thirteen and fifteen one-hundredths (13.15) per cent more concentrations than did the "Frue" Vanners, during a run of twenty-four consecutive days, or a net gold coin result of $199.15, or $8.30 per day, in favor of the two "Triumph" Concentrators.

These returns do not include the value of the amalgam saved by the "Triumphs" during the test, which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarily saved, which is lost on the "Frue" Vanners.

This trial was conducted under the personal supervision of the Manager and Superintendent of that Company, in a strictly fair and impartial manner, and with the sole view of determining, in the interest of that Company, the merits and demerits of the respective machines by a thoroughly practical test. A relation of the course of procedure, a concise analysis of assays, and a tabulated statement of the net bullion results, with accurate deductions therefrom, will soon be published in Circular form.

The superiority of the present construction of the "Triumph" over the form originally introduced, together with the demonstrated results of the above, and other trials had with the "Frue" Vanners, induce us to and we hereby accept the Challenge of $1,000, flaunted by the Agents of the "Frue Vanning Machine Company," and hold ourselves in readiness to enter into a second competitive trial for that sum, at such place and upon such terms and conditions as may hereafter be mutually arranged.

We guarantee purchasers against all costs, expenses or charges incurred by reason of any infringements of any existing patents.

"Put up or shut up," and "Let the Best Machine win!"

JOSHUA HENDY MACHINE WORKS,
Nos. 39 to 51 Fremont St., San Francisco, Cal.

THE DUNCAN CONCENTRATOR

BEYOND QUESTION THE
Cheapest and Most Effective Machine
OF THE KIND NOW IN USE.
Adapted to All Grades and Classes of Ores.

This machine has been thoroughly tested for the past two years under a great variety of conditions giving most extraordinary results, far in advance of anything ever before realized.

A recent competitive test made with the Frue at the Carlisle mine, in New Mexico, showed an advantage of 30 per cent in favor of the Duncan. The amount saved over the Frue being sufficient to pay the entire cost of the machines nearly every month of the year. The following is an enumeration of its many advantages over all other similar machines:

1. Its cost is not more than half that of any other of equal capacity, and the weight is nearly 1,000 pounds less, thus greatly reducing the cost of transportation.
2. The expense of setting up in running order is not more than one-third that of the Frue, or any other belt machine, much less grading and timber work being necessary.
3. The expenditure for repair is not more than one-fifth that of any belt machine, and they will last fully three times as long, working under the same conditions.
4. Not more than one-half the space is required—a point of great importance where a considerable number are used.
5. No special skill and very little care is necessary to operate it.
6. No more water is required than is furnished by the batteries.
7. It saves all the amalgam, gold or silver, that escapes the batteries, pans or settlers—AN INVALUABLE FEATURE, and claimed by no other, making the machine worth more than it costs for this purpose alone.
8. A much coaser grade of ore can be handled successfully than by any other machine—a great advantage in many instances where fine crushing is not necessary to eliminate the mineral.
9. It has no small and delicate mechanism, requiring nice adjustment and the closest attention an insuperable objection to all belt and other forms of machines, making them wholly unfit for the rough service of a quartz mill.
10. Great simplicity of construction and small number of wearing parts. The whole machine is comprised in 17 pieces, only 3 of which are subject to any especial wear, and these can be replaced at a nominal cost. The Frue has 113 pieces, and some similar machines many more, making a complication of parts that involves constant repair and great expense in this way, as well as in loss of time.

We are aware that the most sweeping and pretentious claims are made for nearly every concentrator in the market, but it is a well-known fact that the results of their operation have not in any instance made good these claims. The advantages here set forth for the Duncan, as well as the statements made, we are prepared to substantiate by actual working results. **Price, $350. Weight, about 1,750 pounds.**

PACIFIC IRON WORKS, RANKIN, BRAYTON & CO., San Francisco, Cal.

☞ SEND FOR CIRCULAR. Mention this Paper.

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IS ACKNOWLEDGED BY USERS AS THE BEST in the world. Unlike all other Packings, the **Jenkins Standard Packing** can be made any thickness desired in a joint by placing two or as many thicknesses together as desired, and following up joint, it vulcanizes in place and becomes a metal of itself (it is frequently called Jenkins Metal), and will last for years, as it does not rot or burn out. Avoid all imitations, as a good article is always subject to cheap imitations. The **genuine** has stamped on every sheet "**Jenkins Standard Packing**," and is for sale by the Trade generally.

Manufactured only by
JENKINS BROS., 71 John St., New York.

For Sale by
DUNHAM, CARRIGAN & CO., San Francisco, Cal.

J. MACDONOUGH. J. C. WILSON.

J. MACDONOUGH & CO.,
Importers and Dealers in all kinds of
COAL and PIG IRON,
41 Market Street, cor. Spear, San Francisco, Cal.
PIG IRON, ENGLISH FOUNDRY COKE, CUMBERLAND & LEHIGH COAL
SPECIALTIES.

DEWEY & CO. { 252 MARKET ST., S. F. / Elevator 12 Front St } PATENT AGENTS.

LUBRICATING OILS

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MINING AND SCIENTIFIC PRESS.

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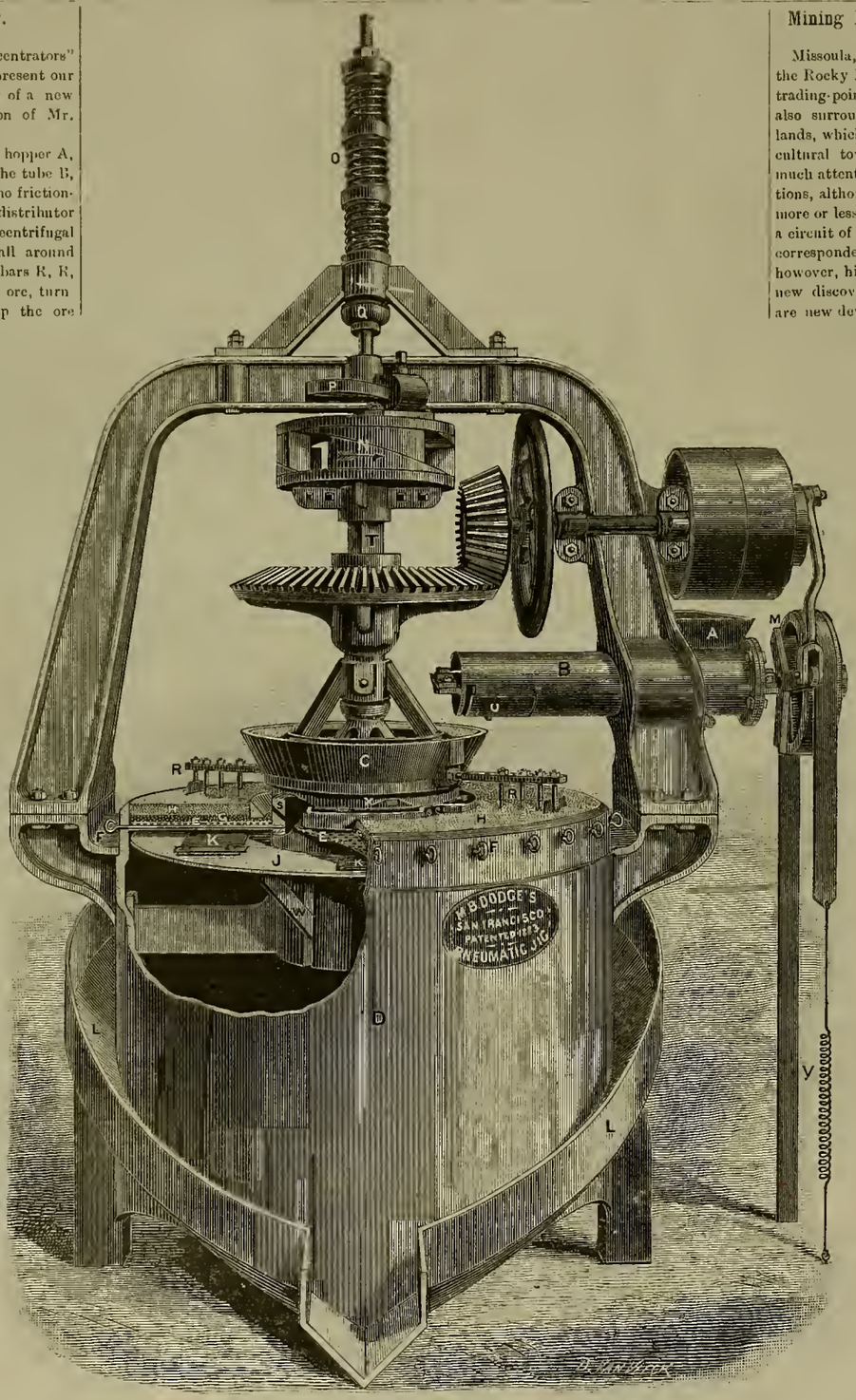
Dodge's Pneumatic Jig.

Having described several "wet concentrators" in recent numbers of the PRESS, we present our readers this week with an engraving of a new dry ore concentrator, the invention of Mr. Miles B. Dodge of this city.

The pulverized ore is fed in at the hopper A, from which it is conveyed through the tube B, in which is a conveyor actuated by the friction-clutch M, delivering the ore into the distributor C, through gate U, which, by the centrifugal motion, distributes the ore evenly all around on the machine D. The small iron bars R, R, with iron stirrers, go down into the ore, turning with the distributor C, and keep the ore even on the bed of the machine. Motion is given to the bellows J by the gear-wheels and disk T, on which are three cams, N, which move a rod downward that is connected withthe bellows J by arms W. When the cams move the bellow's disk J down, air is taken in as the cams drop off from each other, the steel springs O bring the bellows up suddenly, striking on the buffer Q, which causes a sudden strong puff of air through the sheet-iron screen E, and lifts the mass of ore on the machine very rapidly, the mineral taking a position as may be seen by the dark stratum of mineral G, and the gangue or worthless rock taking its position on top of the mineral, as will be observed by looking at the stratum of sand H, H, which is of a lighter color than the mineral on the bed. By looking closely, near letter S, is a cup which comes down close to the screen E, which only allows the mineral to pass under it. As the top line of mineral is above the space under the cup, the mineral, rising up by the puffs of air on the inside of the cup, passes out of the machine at the opening S, down into a box in the center of the machine. That the mineral may not pass out too fast and leave too little bed of mineral on the machine, there are gates of sheet-iron that may be seen in the engraving, which will regulate the amount of mineral required on the machine. The fine mineral passes through the screen, on and off between the edges of the bellows J and the machine, into the box of minerals in the center of the machine. While the puffs of air are constantly making a separation of the mineral and gangue as it comes on to the machine, the worthless matter passes over the edge all around the machine into the troughs L, L, and passes off from the machine. To the rods F are fastened the screen that holds thebed up by loops of wire passing through the screen around the rods and twisted up in loops. The strap of leather and wire spring V is to give steady motion to the friction-clutch.

The machine has been well tested, and may be seen in operation, at any time, at the works of Messrs. Savage, Son & Co., No. 139 Fremont street, in this city. Mr. Dodge claims to be able to do closer work with this concentrator than can be done by wet concentrators.



DODGE'S PNEUMATIC JIG FOR CONCENTRATING ORES DRY.

Mining Prospects at Missoula, M. T.

Missoula, lying at a gateway in one spur of the Rocky Mountains, and therefore a natural trading-point in the early history of our frontier; also surrounded by agricultural and grazing lands, which have made it somewhat an agricultural town—this place has never olicited much attention as a center for mining operations, although there have for many years been more or less operations in that industry within a circuit of 20 miles from the town. As our correspondent passed through the place recently, however, his attention was directed to certain new discoveries and prospects. First, there are new developments in the old placer camp, called Nine-mile District, that distance from town. Here have existed for many years, placer works on a small scale, but quite lately a ledge of quartz has been struck, which, from average assays, yields about $80 per ton, the larger percentage of value being in gold. The samples assayed were from the French lode, which is the property of Mr. Dickinson, the postmaster at Missoula, Mayor Meyer, a fine machinist, and Dr. De Nayer. There are two claims adjoining the French lode, and prospecting is going on with good results by other parties. Then, there have been assays made from ore taken out of ledges discovered in the Wallace District, lying about 20 miles east of Missoula, near the line of the N. P. Railroad. The discoveries here are quite recent. Already about 40 locations have been made. The Aladin, an iron-cap mine, is down 75 feet; the Kenebec, down 60 to 70 feet; Potosi, 35 to 40 feet; West Point, 35 feet; and the Hidden Treasure, 35 feet. In the latter location the ore crops out at the surface, and specimens from it are the principal samples treated to ascertain the value of the developments. Already the Hidden Treasure is bonded for a large sum. The ore in this district will need to be smelted, but abundance of timber for charcoal or for direct smelting uses is abundant. So also is water. The ore carries copper, 15 to 20 per cent in value; silver, 60 per cent; gold, 15 to 40 per cent. Already four veins of ore have been struck, all lying parallel. Our information concerning these matters is derived mainly from Captain Dickinson, of Missoula, who, with Captain Higgins, of the Missoula Bank, and Messrs. McCormick and Choquette, propose to do what they can to develop the hidden resources in the vicinity of their town. A meeting of the citizens of the place was to be called soon, to discuss steps that might wisely be taken.

Cauca Mining District, U. S. of Colombia.

The following is a portion of a paper read before the American Institute of Mining Engineers, by John Hays Hammond:

The following notes are descriptive of a country as yet in its infancy as regards the advancement made in mining operations. Its inaccessibility and other militating circumstances have started progress in that direction. With the completion of the railroad, now under construction, having the city of Cali as its objective point, with the concomitant civilizing and developing consequences, it is certain that the slopes of the Cordilleras will prove to be a South American Eldorado. Deposits of coal, copper and minerals other than those of the precious metals are known to exist in quantities which, under more favorable conditions of accessibility, etc., could be profitably mined. The Government of the United States of Colombia, I think, is disposed to encourage and foster mining enterprises. Articles designed for mining are admitted free of duty; the permanency of the government is, at least, as well assured as that of Mexico (which is not noted for its immutability), and a more sincerely friendly sentiment towards Americans prevails in the United States of Colombia than in Mexico. This paper is confined to a description of the property of the Cauca Company's mines, and is intended rather as a preliminary notice than as an exhaustive report. The Cauca mining district is reached by the following route: New York to Aspinwall; to Panama; to Buenaventura, a port on the west coast of the United States of Colombia, distant thirty-six hours from Panama by steamer; to Cali, in the State of Cauca. The State of Cauca is bounded on the north by the Atlantic ocean, on the northwest by the State of Panama, on the northeast by the States of Bolivar and Antioquia, on the east by Brazil and Venzuela, on the south by the Republic of Ecuador, and on the west by the Pacific ocean. It has a territory of 41,443 square miles, which is about one-tenth of the entire territory of the United States of Colombia. Its population, including the 50,000 savage Indians of the Caqueta (some of whom are cannibals), is nearly 450,000 souls, or about one-sixth of the population of the Colombian republic. Of these one-fifth are whites (Spanish South Americans), two-fifths mixed, two-fifths negroes and Indians. The climate of the country varies in its different parts. Along the coast are fevers of the most malignant types, but the interior and more elevated portions are exceptionally healthful. There are two dry and two wet seasons, alternating, designated respectively *verano* and *cierno*. To the dry season or *verano*, belong the months of January, February, March, July, August, and September, while the other months are included in the *cierno* or the wet season.

Cali is a city of some 13,000 inhabitants, situated in the beautiful, fertile, and salubrious valley of the Cauca, a valley included between the western and middle ranges of the Cordilleras of the Andes. It is about seventy miles distant in a southeastly direction from the port of Buenaventuta, and at an altitude of 3,400 feet above the sea-level. The city of Cali is reached by means of a railroad to its present terminus, Cordova, twelve miles from Buenaventura, and from there by an excellent horseback road to the foot of the Western Cordilleras, whence a good, but somewhat steep road, crossing the mountains at an altitude of 6,000 feet, leads to Cali. The mines of the Cauca Mining Company are embraced in a large tract of land, covering some 400 square miles, and situated about 40 miles to the south of Cali. The situation of the company's mining property is in many respects most favorable. The climate in that section is one of rare salubrity; the heat due to the close proximity—about two degrees north latitude—to the equator, is tempered by the high altitude of some 4,500 to 5,000 feet above sea-level. Water and fuel are everywhere abundant; provisions are plentiful and cheap; and labor, though at present somewhat scarce, could, in the event of the inauguration of mining, be obtained from neighboring districts. Experienced Spanish-American miners from the adjoining mining States of Antioquia and Tolima, at from one to two dollars per day, with negroes, or preferably Indians, for from 50 to 75 cents per day, could make up the complement of mining laborers, were an enterprise to be initiated upon this property.

At present mining is carried on in a most primitive manner. Negro women are

The Miners of the Country.

Their implements of mining are restricted to the crowbar and the *almocrafre*. The *almocrafre* is the vade-mecum of the prospectors of the Cauca country. It is to them what the pick and shovel are to the prospectors of our country. This tool is a blade of steel from eight to twenty inches in length, and from four to eight inches wide. The blade is bent and the end pointed, somewhat resembling in form a pruning knife. It has a handle about a foot long. Picks, shovels and powder are almost entirely unknown. *Puruheles* of the Mexican pattern take the place of wheelbarrows. The *batea* replaces the miner's pan of our own country, and in fact is the only method known to the people for extracting gold. Mercury is rarely used.

With reference to its geographical position, the property may be divided into the "Ensalvado" and the "Cauca" mines.

Ensalvado Mining Property.

The Ensalvado property, lying to the west of the river Cauca, consists of two classes of mining property, different with respect to their geological character. To the first-class belong the auriferous quartz veins, having an approximately parallel easterly and westerly trend through the granite, which almost invariably constitutes the country rock of this district. The developments upon these veins, consisting of but a few feet of shafts or tunnels, are too small to permit any predication as to the persistency of the gold-tenor of the ore in its distribution along the strike and dip of the veins. That the fissures are "permanent," or that the veins are what are generally designated "true fissure-veins" is well evidenced by abundant indications, characteristic of that class of deposits. But it must be observed that the continuity of the fissures is not to be confounded with the continuity of the gold-tenor. The latter can be only ascertained by actual explorations on the veins, especially in a mineral district of underminded character in this regard.

Attending the working of the veins are many economical advantages. Water and wood are everywhere abundant; the topographical features of the country admit in many places the exploitation of the mines by means of tunnels, whereby is obviated the erection or maintenance of an expensive plant for the extraction of the ore; and whereby also, water under high pressure may be utilized for mill-power, effecting a saving in the cost of milling-plant and in the subsequent treatment of the ore. Unfortunately, the veins are narrow, and the extraction of the ore would, in most instances, necessitate the removal of a large volume of the inclosing non-metalliferous granite country-rock. This rock, though more or less soft near the surface, owing to the superficial decomposition, will be found compact and hard when but little depth shall have been attained; and the expense incurred in its removal must needs be very considerable. The ore of the veins consists of a quartz gangue, carrying free gold and chiefly auriferous iron and arsenical pyrites. In some of the veins the ore is much decomposed, while in others the matrix is hard and the ore but little altered.

The Cauca River Mines

Lie immediately in and along the banks of the Cauca river. Much gold has been obtained, and is still extracted from this source. The deposits in question belong to the *Playas*, or alluvian deposits of the river Cauca. These are the results of the deposition by the river Cauca during a period when it assumed larger proportions than at present. The *Playas* are contiguous to the present channel of the Canca. The deposits are obscured to a great extent by vegetation, and as yet are opened up for inspection at but a few points. There are many square miles of these auriferous alluvions, but, owing to the very limited period of my visit to this property, I made an examination of but one point, which was represented to have yielded a large quantity of gold when worked in former years. The inundation of the excavation prevented the further working of these deposits. With the cradle I tested considerable quantities of gravel from different points about the old pits. My tests showed the top-gravel to carry from 10 to 50 cents per cubic yard. These results were obtained from points several feet above the bed-rock. Unfortunately, the bottom of the pit was covered by water, which prevented the sampling of points nearer the bed-rock. Careful sampling and tests made by Messrs. Rahmer and Masse, who carried on the work after my departure, gave much better results than those obtained by me, as above indicated. They were enabled to obtain samples within a few feet of the bed-rock. The gravel from the depth reached by them gave from $4 to $10 per cubic yard, showing very great richness at that level. I have no doubt as to the accuracy of these results; but their sampling was unfortunately necessarily confined to a very limited area. The great disadvantages accompanying the working of these deposits is their flat character and the inferior position of the bed-rock with reference to the water level of the Cauca river. This unfavorable location necessitates the draining of the pits or excavations by means of pumps, and also requires considerable manual labor in the extraction and washing of the auriferous gravel; but there is very little superincumbent material that would not defray a considerable portion of the expense incurred in its removal; and this is a feature of considerable economical importance.

Notwithstanding these disadvantages, if the above experiments made by Messrs. Rahmer and Masse for the determination of the gold tenor of the gravel are not misleading, the *Playas* are certainly worthy of a thorough exploration. The bed-rock has never been explored; and it is from points immediately overlying the bed-rock that the best yield of the gravel is to be anticipated.

CEMENT HARDENING.—Herr E. Landrin, in a paper on the theory of cement hardening, calls the silica which has been precipitated from a silicate by an acid and ignited at a red heat, "hydraulic" silica. It is this which effects the hardening of hydraulic mortars. He disputes the hypothesis of Le Chatelier that the hardening of cement depends, as in the case of gypsum, on supersaturation phenomena,

The Lake Valley Mines.

Concerning the progress of the Lake valley mines, New Mexico, the *Herald* has this to say:

It is nearly three months since we visited and wrote in detail of the condition of the Sierra mines. The work accomplished in that time is certainly extensive, and as important as extensive. All that we stated then as in contemplation has been accomplished, and very much more, while the results in discovering ore bodies are far beyond the expectations of the managers at that time.

First let us look at the improved facilities for working the mine and handling the ore. The loading bins are the first of the improvements to attract attention as you approach the office. Three large bins, for filling when there are no cars at hand, and two shoots, for loading direct from the tram cars, give facilities for loading five cars at a time, which can be accomplished in two or three hours. The tramways run by an easy grade directly into the mines, running out four cars at a time, in charge of one man, and being hauled back by a mule that has almost become automatic in his movements. We found the grade completed for the tramway to the mill, but the track was not yet down. Two days' work will complete it. A tunnel for a double-track railway is being driven—probably complete by the time this will reach the eye of our reader—through the ridge west of the office, much of the way through an excellent body of ore, the purpose being to remove the waste, which is in the way and liable to need frequent removals if piled over the mine as heretofore. By this means an unlimited dumping ground is secured, convenient to the mines, where all waste is moved direct by the tram cars with only one handling.

The steam drills (Ingersoll's) had been at work just about two months, except one of the four, which has not been needed yet. The amount of work accomplished is the best certificate of the value of this investment. Two have been in use constantly, driving the tunnel before referred to, and the third one has been employed most of the time in the open cut of No. 25, where the drilling was done faster than it was possible to remove the rock and ore. More than 100 holes, from 8 to 15 feet deep, are already drilled that have not yet been blasted, the blasting of which would loosen more material than 100 men could remove in 30 days.

A visit to the mine gave a complete surprise; drifts, at the last visit, had been enlarged into chambers, from which tens of thousands of dollars had already been taken. In the principal one of these chambers they are now using 26 feet props, which means that the ore body is being excavated to a depth from a hanging wall of that many feet; nor is it taken out to the bottom of the ore, the lower grade of that at the bottom rendering it inadvisable to remove it at present. In the chamber the hanging wall only is exposed; there is ore on every hand, of varying grade, but nearly all of it a shipping grade; rich streaks are being followed upward from this chamber, yielding hundreds of sacks of the precious stuff. This ore body is the one discovered by the diamond drill when it was first put in operation, and it is proving larger in extent and better in quality than was indicated by the drill. It is about 80 feet below the surface, and the pitch of the hanging wall, which is uniform for quite a long distance where it has been exposed, indicates that it has a definite formation and extends to an indefinite depth. The explorations of a former manager in this direction led to the conclusion that it was not worth while to look in that direction at all, as there were no indications of ore.

In the absence of the manager we do not feel at liberty to give the details of production and shipment, though we learned something of them in an unofficial way. Regular shipments amount to about two cars daily, and of a higher than average grade. We may safely say that the shipment from Grande was more than 890,000 for the month of July, and about $150,000 for the past two months—this, understand, from a "played out" mine, according to former managers.

The number of men employed in the Grande is about one hundred and seventy, and in the Bella seventy. The force on the Apache has been taken off and both of the diamond drills are being used for the prospecting there now. The Bella is not at present yielding as it was at the time of our last visit, the drifts having run through the rich streak of ore which they were in, but the prospect is good for finding them again any day.

In conclusion we may add that the mines never promised better than at the present moment. With large ore bodies in sight and good prospects for their continuance, and with facilities for rapid and economical workings, with prudent and skillfull management the stockholders may reasonably look forward to a period of dividend payments, which will not be disagreeable to them. The extaordinary expenditures for outfit and putting the mine in order are practically completed, and now the entire net proceeds will be available for dividends.

STEAM ROCKETS.—The fact that a steam boiler, standing on its end, can, by explosion, project itself several hundred feet away, passing over the tops of buildings in its flight, has suggested the invention of a steam sky-rocket. It is thought that such a device might be made specially serviceable as a war weapon.

Gold in Alaska.

A frontiersman named Louis McQuesten who has been in Alaska since 1874, most of the time on the Yukon river, has been interviewed by a *Call* reporter, and among the facts, the following points concerning gold in that region were elicited: Evidences of the precious metals can be found in many parts of Alaska, and I have no doubt that at some future time fortunes will be made out of mines in that region. I wouldn't advise any one to go there with that object in view, however, for a prospector's life is pretty hard up there, and very few will ever make anything in the attempt. Still the gold and silver are there, and whenever they are wanted bad enough they'll be got out. I know of numerous places where there are good placer diggings, and of others where the surface rock looks very promising. For instance, there are lots of bars on the Stewart river, and its tributaries where a man can easily pan out from $5 to $10 a day, and there is just as good a show on the Pelly, and other streams I could mention, while there is a sure $5 a day placer digging within sixty miles southwest of Fort Reliance. Most of these places are very hard to get at, however, and there are very few years when it is warm enough for more than four months' sluicing. Two hundred miles from us, on the Pelly, a prospecting party took out over $700 in dust last summer, and found lots of what promised to be paying quartz leads. They have gone back there this year, to stay through the winter, so as to be early on hand next spring. It is a very tight place to get in and out of, and a party must carry with them all their supplies. From this place on the Pelly they can make the 200 miles to us by dropping down to the Yukon, but the easiest road to get in is a very round-about way. Taking this road you would not start earlier than June 20th from Harrisburg, on the coast, portage sixty miles to the headwaters of the Yukon, and then work down from 350 to 400 miles till you reached the Pelly and the placers. To get out of that place you would have to start by the end of July, for it is very risky to make the attempt after the snows have set in. You see, therefore, that in most of the placer mining you would have to give up an entire year for four or five months' work, and when you take into consideration the cost of supplies and labor of transportation, the result in gold dust would scarcely compensate you. We have struck some ore that looks pretty well right at Fort Reliance, and I have brought down a lot of it with me to assay. If it should turn out to be as good as it looks, our chances would be very fair, for we could get our transportation, etc., comparatively cheap. As I said before, the day will come when a good many mines will be opened up in Alaska, but that day is pretty well distant yet, and won't stand much hurrying, although here and there will be a chance to make money under exceptional circumstances.

THE CUMNER ENGINE CO. have sent a 130-horse-power engine to the Louisville exposition, to drive several of the electric light dynamos on exhibition. They will also furnish one of their Ballantine ice refrigerating machines and a 130 horse-power engine for the St. Louis exposition. The engine will drive an important line of shafting, and the refrigerating machine will be used to keep a comfortable temperature in the music hall, and for referating any perishable articles that may be on exhibition. The following orders have recently been lodged with the Cumner Co.: One large refrigerating machine, with oiled-panel purifier, for the Crescent Brewing Co., of Aurora, Ill., to displace a machine of another make; three refrigerating machines, with apparatus complete, for the large brewery of Heusler & Sons, Newark, N. J.; a 120 horse-power engine, with boilers and outfit complete, for W. H. Cherry & Co., Mountain Mills, Ala.; and two engines, one 250 horse-power and the other 105 horse-power, for the Brooks & Ross Lumber Co., Schofield, Wis. The following are among the recent shipments of this company: A 55 horse-power engine, with outfit complete, for the Fort Wayne Jenney Electric Light Co., for their new plant at Gosben, Ind., and a 55 horse-power outfit, complete, for the flour mills of A. Dietly & Son, Moorheads, Pa. In addition to the above they expect to ship two more good sized engines and another refrigerating machine in the early part of next week, and report orders coming in freely. Cumner engines have just been started in the following places: Amoskeag Cotton Mills, Manchester, N. H.; saw mill of A. L. Johnson & Co., Mimcie, Ind.; linseed oil mills of I. P. Evans & Co., Indianapolis, Ind.; and in the flouring mills of C. B. and D. H. Cowan, Canal Winchester, O.

BUSINESS HASTE.—A medical writer has lately penned a paragraph full of warning to men in trade. He justly ridicules the common practice of persons engaged in commerce, of pretending to be in great haste, and terribly pressed for time at almost every moment of the day running, so to speak, a close race perpetually, as it were, with the old mythological gentleman with the forelock. The house is overwhelmed with business, forsooth. By-and-by this pernicious practice becomes a confirmed habit, the fertile source of many nervous disorders, and not infrequently ends in the mad-house, or a suicide's grave.

MECHANICAL PROGRESS.

Rock Cutting and Dressing Machines.

The rock extracting industry seems to ever remain at the same point. Little progress has been made in the method of quarrying, and nearly everywhere use is still made of the wedge, the lever and powder. Aside from the cost of the work and its defectiveness, there results considerable waste, while the blocks extracted are irregular in shape. To meet these inconveniences and imperfections by some machinery adapted to such work has been the study of inventors and engineers for some years past. Quite recently a Mr. Rapp has devised a machine for cutting rock from the quarry, of which much is expected. The steam power required to run it is from three to four horse power, and the work effected per day by the aid and boy required to run it is equal to that of several men in the usual way, while the work turned out is in regular smooth pieces, all ready for rough use or for immediate finish. The machine may be employed elsewhere than in quarries, and also serves for almost all works of excavation.

Another Quarrying Machine

Is the recent invention of Mr. John Crump, of Philadelphia. Mr. Crump four years ago proposed to himself the project of devising a machine to cut and finish with true surface all kinds of building stone as it lies in the ground, thus saving the enormous waste of blasting processes and the handling of the waste. He engaged Mr. Brereton, the foreman of his quarry, to assist him, and the result of their labors is a novel "rock quarrier and stoneshaper," which they have had patented in all countries under the above name. Its cutting power is shown by the ease with which it goes through the flint in this slate quarry, where at least it is capable of doing remarkable work. Whether it can be as successfully employed in cutting and shaping granite and other hard rocks is not decisively proved as yet, though it is designed for such use.

The machine in its essential features is as novel as it is effective. It looks like a very course circular saw, but is not driven like a saw, and it makes its cut in an entirely different way. Thus, it runs backward, cutting upward instead of downward, moves very slowly instead of rapidly, and it is driven not from its axle, as saws are generally driven but from its periphery. The cutting desk is substantially like that of a saw, with removable chisel teeth. These have an alternate "set," right and left, and at intervals there is a straight tooth to clear out the silver that the two sets of teeth might otherwise leave. The feeding mechanism is worm-screws and cog-wheels, so geared with the cutter that they move in unison. The whole machine (including the boiler and the steam engine) is mounted upon one framework, and all of the mechanism travels together upon an iron trackway laid upon the rock to be cut. The depth of the cut made is nearly one-half the diameter of the cutting disk, and may be of any length that the quarry permits. The cutter may be set at any desired angle, and if the stone is to be finished before its removal, files are attached to each side of the saw-plate, slightly wider than the cutter, thus removing the saw-tooth marks.

The teeth of the cutter are removable, and they are removed and replaced while the cutter is at work. The cutters do not get hot. The machine moves so slowly that a boy has plenty of time to take out a dull tooth as the saw comes up from the stone, and replace it with another before the part of the blade from which it was removed has again passed below the surface of the stone. A boy is employed at this work all the time, and with a set of machines at work, the teeth are being constantly re-sharpened, ready for return to the cutting disks of steel. In the roofing slate-quarry, the machine is said to work admirably. It makes a cut "across grain", about 36 feet in length, or with the grain 75 feet in a day, and of a depth proportioned to the diameter of the saw or cutter. There is practically no waste in quarrying by this process. It saves from 10 to 30 tons of waste for each ton made marketable. Cross cuts, leaving sharp square edges and corners, can be made, but in quarrying for roofing slate only lateral cutting is required. Two parallel cuts having been made, a line is nicked out where it is desired to split off the block, and a few sharp blows determine the fracture. The blocks are then removed from the quarry, and at once split and shaped by expert workmen into roof slate.

Finishing by Pressure.

Under this heading a paragraph recently appeared in this journal stating that drop-forged articles of Norway iron had yielded to a permanent compression of one four-hundredth of an inch under a pressure of 800 tons. The result of this compression is to change the character of the material to a considerable depth, compacting its fibers so that the surface is almost a perfect one, requiring but a slight amount of polishing to bring out its clean, bright characteristics.

More noticeable results have been obtained on articles of malleable cast iron, the honeycombed, loose fiber of the re-heated casting being forced in on itself, so as to greatly change its character. Under a pressure of 500 tons the malleable iron yields almost one-sixteenth of an inch, and becomes almost as solid as steel. Wrenches for agricultural implements, and for ordinary farm, stable and home use, cast and made malleable by heating in boxes packed with pyrogenous oxide of iron, come out so soft and yielding in texture that they are almost like pewter; but put under this pressure, they come to a rigidity that is surprising, resembling that of tempered steel.

A press for this work has recently been built, which produces the pressure by the well-known toggle or knuckle joint. The machine weighs seven tons; the head under which the pressure is given is re-enforced from the base by two five-inch steel bolts; the dies are adjusted by screws moving an inclined plate or wedge, that provides a solid bearing at all times and at every stage of adjustment. The throw of the die is one and a half inches, and is produced by the toggle joint driven by a lever from an eccentric, the shaft of which carries a gear wheel that is driven by a pinion which is to the wheel as one to six. The lever from the eccentric does not engage with the toggle joint at its center, but by a connecting bar above the center, thus giving greater leverage than by the ordinary method. *Scientific American.*

A New Furnace Device.

If all that is claimed for the following process is true, it must prove a most important invention in connection with the iron industry—perhaps the most important since Bessemers invention for making steel. As yet, however, it has only been used at Joliet. Many inventions of this nature, which were full of promise at the start, have proven in the end utter failures. We give the paragraph as we find it in the *Stove and Hardware Gazette*:

According to recent advices the "themogen" process of heating furnaces, which does away with the use of coal gas, has just been pronounced satisfactory at the Joliet, Ill., Iron and Steel Company's rolling mill, after a trial of several weeks, and it will be exclusively used in that mill in the future. It is simple and very cheap, enabling six men to do the work of sixty, and saving enormous coal bills. The "thermogen" consists of an oblong cylindrical apparatus, four feet in length and two feet in diameter. It is placed over a furnace four feet square and seven feet high, and when in use it is kept in a cherry red heat. A crude petroleum tank is connected with it, and the petroleum is forced by a pump through a small pipe and regulator into the heated cylinder. The vapor is conducted through steam pipes to the flues of the furnaces, where it is ignited with the hydrogen gas supplied by a large boiler. The pressure is so regulated that the most absolute safety is assured. The fuel is called vapor fuel, and is a wonderful substitute for the gas generated by a very expensive and cumbersome system of machinery, requiring many hands and immense quantities of coal, and costing $50,000. The expense of the "thermogen" and cost of operating it is mere nominal, and will not cost as much as the coal consumed in one day by the old system, while the results are said to be far better, as well as more practical.

SCREW MANUFACTURE.—The process of making screws is a very interesting one. The rough, large wire, in big coils, is, by drawing through a hole of less diameter than itself, made the needed size. Then it goes into a machine that at one motion cuts it a proper length and makes a head on it. Then it is put into sawdust and "rattled," and thus brightened. Then the head is shaved down smoothly to the proper size, and the nick is put in at the same time. After "rattling" again in the sawdust, the thread is cut by another machine: and after another "rattling" and a thorough drying, the screws are assorted by hand (the fingers of those who do this move almost like lightning), grossed by weight, and packed for shipment. That which renders it possible for machines to do all this is a little contrivance that looks and opens and shuts like a goose's bill, which picks up a single screw at a time, carries it where needed, holds it until grasped by something else, and returns for another. This is one of the most wonderful pieces of automatic machinery ever seen, and it has done its distinctive work at the rate of 31 screws a minute, although this rate is only experimental as yet. Ninety-three gross a day, however, has been the regular work of one machine.—*Philadelphia Bulletin.*

TO USE IRON CASTINGS AS A PATTERN.—A correspondent of the *Scientific American* asks that journal how to prepare the iron casting of any object to serve as a pattern for others. How to go to work to design in orthographic projection any object having warped surfaces or surfaces of double curvature, and surfaces following no law, like the helicoid, for instance. From the drawing of such an object a pattern maker is to make a pattern having certain dimensions. The journal named answers as follows: Iron patterns should be thoroughly cleaned of the sand scale by pickling with sulphuric acid one part, water four parts, for several hours; then scrub the surface with a metallic brush, or smooth the roughness of the pattern casting with files or pieces of broken grindstone. When cleaned and made ready for a pattern, it may be warmed by any means to a temperature that will melt beeswax. Rub the beeswax all over the pattern, wipe off any excess that may lodge in cavities, leaving upon the iron pattern only a very thin coat of wax. When cold it will be ready for the sand.

SCIENTIFIC PROGRESS.

An Ancient Road and Tunnel.

Recent years have been most prolific in the discoveries of prehistoric remains. Two most notable instances of that character have just come to hand. The first is the discovery of what is undoubtedly the most ancient artificial roadway that is or perhaps ever will be made known—that is, if the reports concerning it are correct. The discovery occurred in the valley of the Ancholme. Some laborers who were excavating brick earth came upon a corduroy road at a depth of some seven feet below the surface. Above the road is a stratum of six feet of clay, and upon the clay lies a layer of peat. It is known that this peat has occupied its present position for considerably more than a thousand years, a Roman road, which is still in good order, crossing it. The newly discovered track is formed of huge oaken beams, which are fastened into the glacial drift beneath by oaken pins, and it is believed by geologists who have visited the excavations that these timbers must have been laid down many thousands of years ago. The track seems to be about a mile in length, but whither it led and what was its use are questions which are scarcely likely to be solved. The geological indications would point to an antiquity thousands of years before the earliest dates of recorded history.

The second discovery above alluded to—that of a very ancient underground and artificial water, way is referred to by a cotemporary as follows:

After years of exertion, the present governor of Samos, Abyssides Pasha, has succeeded in uncovering the entrances to a tunnel of which Herodotus speaks with admiration as the work of Eupalinos and Megnira, and which, according to the same authority, was built during the tenth century B. C. The tunnel about 5,000 feet long, was intended to secure a supply of fresh water to the old seaport town of Samos, and consists of three parts. These are: The tunnel proper, 5½ feet high and 6 feet wide; a canal about 5 feet deep and nearly 3 feet wide which runs in the middle or on the side of the base of the tunnel, and the aqueduct running in this canal. The aqueduct consists of earthen pipes, each two and one fifth feet long, 32 to 33 inches in circumference, the sides averaging about 1½ inches in thickness. Every other joint has a hole, for what purpose has not yet been fully explained. Mr. Stamatiades, a Greek archæologist, believes that they were intended to facilitate the cleaning of the pipes, and to make the flow of water easier. The canal is arched over, but 28 manholes were provided to admit the workmen who were charged with cleaning and repairing the aqueduct. The tunnel is not quite straight, forming an elbow about 1,300 feet from one of the entrances. This elbow according to Stamatiades, was caused by a mistake in the calculations of the engineers, who had none of the instruments used in tunnel-building nowadays. The tunnel starts near a small water course which may have been quite a stream in olden times, pierces the mountain Kastri which was formerly crowned by the fort Samos, and ends a few hundred yards from the old town of Samos, about 10 feet below the surface. From the mountain slops to the city this subterranean aqueduct is protected by a massive stone structure, ending within the walls of the present convent of St. John. The preservation of this work—which is truly wonderful considering the imperfect mechanical resources at the disposal of its builders—for nearly 3,000 years is probably due to the care taken by Eupalinos, who in all places where the rock did not seem of sufficient firmness lined the tunnel with several layers of brick, running on the top into a peaked arch.

An Electrical Filter.

Electricity still continues to assert its usefulness in hitherto unlooked for directions. Its latest adaptation is to filtering purposes, with the view of preventing the spread of cholera and typhoid fever. A short time since a letter appeared in the London *Times*, from Dr. Dobell, on the prevention of those diseases, in which he directed attention to a method of destroying cholera and typhoid germs in drinking water by passing through it an electric current, and thereby exposing it to the influence of nascent oxygen, by which means the water would be dezymotised. Dr. Dobell would appear to have been forestalled in his suggestion by the construction of a filter by Dr. Stephen H. Emmens upon this principle. The filter consists of an earthenware vessel in which are placed porous cells containing carbon plates, the spaces between the plates and the cells being partially filled with animal charcoal or spongy iron. The plates are coupled up with the positive pole of a Leclanche battery, or of one of the company's own chromozone batteries. Alternating with the porous cells, are other carbon plates which are coupled up with the negative pole of the battery. The water is supplied into the porous cells, and passes through the charcoal or spongy iron to the exterior of the cells, and is drawn off by a tap in the usual way.

It is claimed that by this means, the water being submitted to the influence of the evolved nascent oxygen, as suggested by Dr. Dobell, the germs of typhoid, cholera, and similar diseases are destroyed, and that an end is put to the dreaded danger of death from this source.

The above is not the only application of Dr. Emmens' system. We understand that it is claimed to be available for the treatment of sewage upon even the largest scale. For this purpose the inventor constructs his purifying apparatus in the form of a conduit, divided by suitable partitions into a series of cells, through which the sewage successively flows. The electrodes take the shape of wooden cages, filled alternately with scrap iron and gas carbon; and it is asserted that by this arrangement no outside source of electricity is necessary, as the conduit itself forms a powerful galvanic battery capable of supplying an electric current for public lighting, &c. The sewage, moreover, is not only purified by the nascent oxygen evolved, but it becomes "dosed" to any required degree by iron salts, the disinfecting properties of which are well known, while the oxide of iron may be subsequently precipitated, and will carry down all suspended matter, thus leaving a clear effluent. The Emmens system has certainly much to recommend it from a theoretical point of view, and would appear worthy of trial by local authorities.

HONORS FOR AMERICAN SCHOLARS.—When the announcements were made of the honorary degrees to be conferred at the tercentenary celebration of the University of Edinburgh, some surprise was felt that American men of science appeared to be forgotten, while American physicians and theologians were selected with obvious discrimination for their academic distinctions. It is now stated that the authorities at Edinburgh intimated to several Americans devoted to science that the university would confer upon them the degree of doctor of laws if they would come and receive it, and that, in case of their non-attendance this year, they might be admitted to the honor if present on some future occasion. The list of men thus chosen may not be authentic, and we shall therefore refrain from reprinting it: but, as given to the newspapers, it includes, among others, a geologist and zoologist, a botanist, an astronomer and a philologist, every one of whom would be acknowledged in this country as a worthy representative of American science. —*Science.*

BRITISH SCIENTISTS.—The fifty-fourth annual meeting of the British Association for the Advancement of Science opened in Montreal, Aug. 27th. The weather was fine and cool. It was one of the largest and most representative meetings of the association ever held. The event was a most extraordinary one. For the first time in 53 years the association has left the British Isles. About 1,000 educated ladies and gentlemen have been drawn hither from across the Atlantic by reason of the holding of this meeting in Canada. More than one-half of these never crossed the Atlantic before. Four hundred have been weeks traveling through Canada towards Winnipeg, or threading the mazes of Western and Northwestern States and all of the Territories of the United States. After the closing of the session of the association, the visitors from abroad, almost without exception, intend visiting the meeting of the American association at Philadelphia, after which they will continue their travels, and mainly through the United States. The objective point of many is the Yellowstone region; a few will come to California and to Oregon. Nearly all will make long pilgrimages through the United States.

AN EXPLOSIVE FROM COAL TAR.—German ingenuity has produced another derivative from coal tar in the shape of an explosive for mining purposes or for fire-arms. This resultant is a mixture of saltpeter, chlorate of potash, and a solid hydro-carbon, the latter being paraffin, asphaltum or pitch. The solid ingredients are powdered and intimately mixed, and the mass is then treated with a liquid volatile hydro-carbon, such as benzine or gasolene, which dissolves the solid hydro-carbon and forms the whole into a plastic body. This cake is then rolled into sheets and hardened by allowing the liquid solvent to evaporate, the product afterwards being broken up into grains of any desired size, like ordinary gunpowder. By this method of dissolving the hydro-carbon before or after admixture with the salts, the grains become coated after drying with a water-proof surface of varnish. The new compound is only an explosive when confined in a close space. It possesses the same density as gunpowder and is very hard.

THE VELOCITY OF SOUND IN TUBES.—At a recent meeting of the Physical Society of Great Britain, Mr. Blaikley read a paper on the velocity of sound in small tubes—a continuation of experiments formerly brought before the society by the author. Mr. Blaikley, showed experimentally how his measurements were made. He found that pipes in which the upper proper tones were in harmonic order, or better still, those in which they were far removed from the harmonic order, and therefore dissonant, were best for the purpose. He had obtained velocities from the fine tubes varying from 11.4 to 88.2 mm. in diameter, the former giving 324.38 and the latter 330.13 m. per second as the velocity of sound. In free air Mr. Blaikley thought the velocity would come out 331 m. (1085.68 fect) per second. The differences of velocity for the different pipes were very regular.

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SAN FRANCISCO:

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Passing Events.

The telegraph has brought us news of a very serious strike among the coal miners in Pennsylvania and Ohio. The introduction of hand drills has had something to do with it, and the reduction of wages brought matters to a crisis. There have been serious disturbances, but late advices show that a state of quietness now prevails. News comes also this week of the disbandment of the Tombstone, Arizona, Miners' Union.

The Mechanics' fair in this city closes this week, after a successful exhibition. The State fair, at Sacramento, commences next week.

The business men of this city have instituted an inquiry into the causes of the prevailing depression. The committees appointed will not report until November and will doubtless suggest remedies where possible.

Mining news of any special importance is rather scant just at present. It will not be long now before proprietors in the mining regions will have to come into united quarters.

THE Sierra Grande Mining Company of New Mexico, incorporated at Philadelphia, has declared a dividend of 25c per share, or $100,000, payable on the 5th. This is the ninth dividend and the total is $860,000. The previous dividend was paid last July.

MINING dividends declared in August in this city aggregate $203,250, as against $156,000 in the same month last year.

Water in Quartz Mills.

There is no douht that the character of the water used in the batteries of quartz mills influences the process of amalgamation under certain circumstances. Water used for this purpose ought to he pure and free from mineral salts. It is sometimes the case that the water pumped from the mine itself is used in the batteries, and when this is done it is not certain that as good results will follow in amalgamation as if purer water were used. In the course of some experiments made in the New Zealand gold mines, on this subject, it was found that the character of the water influences the yield largely. They tried to find out the relative effects of the use of sea-water, rain water and mineral water. Some tailings were taken, well mixed and divided off for the several experiments. Every care was taken to insure the same conditions in working with the several waters—the same head of water, speed of delivery, etc.

The mineral water was prepared hy dissolving six grams of protosulphate of iron (crystallized) to the gallon of water, prior to use; this heing the most common and prejudicial salt existing in the shaft-water of the mines in the region where the experiments were carried out. The result showed that on the same ore, with same conditions, they ohtained when using the rain-water, 8 dwt., 17 gr. of gold per ton; with sea-water, 8 dwt., 14 gr.; and with mineral water, 6 dwt., 1 gr.

They found that the principal cause of the flouring or sickening of the mercury was the presence of sulphate of iron in the ore, and as the salt is freely soluhle in water, one way of preventing the mercury heing affected in this manner is to wash the auriferous material impregnated with the material, before working. To a certain extent when good water is used the ill effects of the metallic sulphate present in the veius, are diminished. The use of water in milling, containing any notable quantity of sulphates, acts even more prejudicially than the sulphates naturally existing in the ore itself, even were they ever so abundant.

It follows that millmen should employ the greatest quautity of good water that the incline of the copper plates will safely allow, since the solution of these metallic salts is thereby weakened, and so correspondingly less productive of harm. This, of course, where such salts exist in the ore. Unfortunately, millmen are not always in a position to use perfectly pure water, hut, hy taking proper precaution, much loss and trouble will he prevented.

Primitive Gold Washing.

The gypsies of the Bannat in Austro-Hungary, in washing the gold from the sands of the rivers and plains, still use a very antiquated system, out of which, no doubt, the modern systems have grown. It is practiced now hy the gypsies, as it was hy the Romans in the same country. It consists in nothing more than pouring the sand, mixed with water, over an inclined plane, the heavier particles of the gold remaining upon the surface, while the light impurities are washed away. Sometimes the inclined plane is covered with woolen cloth, to which the gold adheres; wanting the cloth, the gypsies now and then use for the same purpose the more ancient substitute of a fleece. The manner of collecting gold dust on sheep's fleeces, upon inclined planes, is represented in the curious old work of Agricola.

In the rivers of Colchis the custom is still retained of placing sheep skins in the beds of the Phasis and other auriferous streams to collect particles of gold; hence, the dedication of such fleeces to the Gods, and the fabulous history of the Argonauts, as far as it related to the Golden Fleece.

The more common manipulation among the gypsies of Eannat, as far as the gold washing is concerned, is performed by means of a plank of lime tree, six feet long, and au inch and a half thick. At the upper extremity is a small trough, and across the hoard are about a dozen grooves or furrows cut in the wood. The plank is set at an angle of forty-five degrees. The sand is put into the trough at the upper end, and thence, by plenty of water, washed down the sloping board. The gold dust falls into the grooves, whence it is scraped or brushed off. It might be supposed that a great deal of gold is lost by the careless method, hut loug experience has made the gypsies very expert; they know how to distinguish the rich and poor sand and a careful examination of the tailings proves that hardly a particle of gold escapes them during the operation. The gold is in the form of a fine dust; the sand containing it is mixed with black particles of highly magnetic iron, garnets and mica.

The Fair.

The Mechanics' fair which closes this week has heen a very successful exhibition in every way. It has accomplished a very valuable result in showing the thousands of visitors how varied are our industrial resources, and how many things we use are made in our midst. They see hundreds of things which our own citizens manufacture, and are ahle to recognize the fact, by ocular proof, that our home-made articles are decidedly worthy of patronage. Carriages, wagons and vehicles of every description are there to choose from. Brass goods of all kinds shine resplendant. Iron in the ore, in the pig and made up into all conceivable shapes—nails and tacks, saws and sawyers tools, etc. There are pianos and organs made here, musical instruments of various kinds. Art castings, wire goods, safes, cutlery, wood and iron making machinery, pumps, harness, boots and shoes, mantles, hells, gas fixtures, drills, furniture and a thousand and one things we use in daily life.

On one hand is a grand array of heautifully made vehicles, and on another a glittering pile of glassware of all shapes and colors. Near by is a wondrous display of floral heauties, arranged in attractive and unique designs. Then agricultural machinery, windmills, washing machines, lamps, woodenware utensils, household appliances of all kinds, and articles of luxury and ornament. There are hoys and girls making cigars and showing how they practice their trade; and then machinery which shows how beautiful embroidery work is accomplished with hut one guiding hand. All the many appliances used with horses are shown in a group; and near them, art materials, pictures, ornamental glass—stained and white. Then there is the art gallery, with its treasures so gratifying to the lovers of the beautiful, and which is thronged day and evening.

Each of our local artisans and dealers displays to best advantage his products and his wares, and to those persons who are his daily customers. New inventions, new appliances, old things in new form, are seen on every side. Articles for use or ornament abound in profusion, and no man can wander among the displays without learning something or seeing new things. The crowds themselves are worthy of study. There the capitalist, the elegantly-dressed lady, the solid citizen, the merchant, the mechanic, artisan and the laborer, all mingle freely, engaged in the same pursuit—an indulgence of curiosity. The galleries are crowded with gayly-dressed multitudes, while the more thoughtful stroll slowly through the aisles and listen to the explanation of the various articles hy the exhihitors.

It would be idle to attempt to go into details of the various exhihits, and it is of the fair as a whole we write. These annually recurring exhihitions are a powerful factor in the industrial education of a progressive people. They teach others what the producing classes are doing, and how they do it. They show people tools and appliances for carrying on work, with only the products of which they are generally familiar. They create an interest in industrial pursuits and hring producer and consumer closer together. They bring forth a spirit of honorahle emulation among artisans and mechanics, and result in hetter work, more careful attention to details, and more artistic designs. Each advancing year shows improvement and variety in our local industries, which evidences also progress among the people themselves who are engaged in them.

MR. HENRY E. MATTHEWS, Secretary of the Lick Trust, who is a skilled amateur photographer, has taken some very fine views of the interior of the Mechanics' pavilion. Mr. Matthews has a creditable display of his photographs in the fair, among them some pictures of the Lick observatory at Mt. Hamilton, some marine pictures, etc.

THE Society of California Pioneers will lay the corner-stone of their new huilding on Admission Day—September 9th.

A New Electrical Apparatus.

Dr. James B. Williams at No. 759 Market street in this city, the inventor and maker of the large electro-medical apparatus which was illustrated and described in this paper in March 1881, and which was considered both here and in the East as the most complete apparatus of the kind ever made, has recently completed a new and improved apparatus for removing cancers, tumors, fistulæ etc., by the aid of electricity, without the use of knives, scissors or needles. It consists of three separate generators, all contained in the same case, which may he used either singly or in combination, depending upon the quantity or tension of current required to effect the removal of different sized growths. It also embraces several improvements not hitherto used in any similar apparatus, the most important being the "switch system" for regulating and controling the currents, and the exciting fluid for the generators or piles. The switch system is very perfect in its action, enahling the operator to have *instantaneous* control over the current, and also permitting the "resting" or "alternating" of the plates, which, together with the peculiar properties of the exciting solution used, does away with the disagreeable effects of polarization, without the use of "agitators" or "air-tubes."

The apparatus is supplied with electrodes of an entirely new pattern, for applying the current to external growths, as well as to growths situated in portions of the hody where the use of the knife would he attended with danger.

The advantages of operating by the use of the electric current in certain cases over those of the knife have been fully demonstrated, the principal objection heretofore existing being that very little dependence could be placed upon the efficiency of the apparatuses, and which may be briefly enumerated as follows:

Entire removal of the growth operated upon. Absence of hemorrhage during the operation, the mouths of all the hlood vessels heing completely occluded. Rapidity of operating. In many instances, such as removing the tongue, hemorrhoids, the destruction of fistulæ, etc., occupying from a half to two or three minutes only. No danger of septicæmia, or hlood poisoning, there heing no open vessels remaining to absorb morhid material. No destruction of tissue other than that operated upon, as the current is confined entirely to the electrodes, and does not enter the hody at all. Very little shock, if any, to the nervous system. Ready portability of the apparatus, thus enahling parties to he operated upon at their own homes.

The apparatus is not only quite simple in its operation hut is exceedingly ingenious in design. Dr. Williams made the whole apparatus with his own hands, and has heen upwards of a year engaged upon it. The instruments which are used in the connection with the battory are of peculiar design and had to be made specially of course. These also, Dr. Williams made himself.

THE INTERNATIONAL ELECTRICAL EXHIBITION at Philadelphia opened on the 2d inst. The Edison, United States Brush and Thompson-Houston companies will have 350 arc lights and 6,000 incandescent lights. Of the latter 3,800 are those of the Edison Company, 1,200 of the United States Company and 1,000 of the other companies. There are five classes of apparatus for the production of electricity, including all kinds of electric generators. The electric conductors alone require seven distinct classes, in each of which are many exhibits. There will be electric telegraphs, telephones, microphones, fire and burglar alarms, annunciators, electric clocks, time telegraphs, registering and signaling apparatus, applications of electricity in dentistry, surgery, warfare, mining, blasting, spinning, weaving, traps, snares, pneumatic apparatus, writing, printing, musical instruments, conjuring apparatus and toys.

A FEW days ago Mr. Day, engineer at the Day furnace, Pioche, Nevada, was down the well repairing the pump, when an explosion occurred in the bottom, and a white vapor instantly arose from the water, accompanied by the pungent fumes of ammonia, which nearly strangled Mr. Webster before he could regain the surface. The white ammoniacal vapor is still arising from the well, and is as pungent as an old-fashioned hartshorn smelling hottle.

IT is stated that a single blast on Telegraph Hill, in this city, one day this week, loosened about 8,000 tons of rock. The material is being used in forming a seawall.

The New Pavilion at Sacramento.

This year's State fair will be the first in the grand new pavilion erected last year by the combined enterprise of the State at large and the city and county of Sacramento. The engraving on this page gives a good view of the handsome structure. During the next two weeks it will be a center of attraction for the people of the whole State and the many who are sojourning amongst us. Its interior will be well filled with what will, in all probability, prove the grandest collection of California products and manufactures and art treasures ever made.

As this will be its first employment for the purpose for which it was constructed, a sketch of its history and a few notes of its dimensions and leading features will be acceptable, no doubt, both to those who attend the fair and to those who remain at their homes.

The State Agricultural Society for several years agitated the question of a new exposition building. The society, being under supervision of the State, the Board of Directors deemed it proper to advise the construction of a State agricultural and industrial expositiou building upon the State capital grounds. A conference was held with the Sacramento Board of Trade and it was agreed that the city of Sacramento should be asked to subscribe the sum of $30,000, and the county the proceeds of sale of the old pavilion, to aid in the erection of this grand structure, provided the State could be induced to appropriate a like amount. At the convening of the Legislature the Sacramento delegation, consisting of Senators Cox and Routier, and Representatives Larue, Doty and Ryan, agreed to the introduction of a bill appropriating the desired amount. After considerable delay, the bill finally passed both Houses, and was approved by Governor Stoneman March 9, 1883.

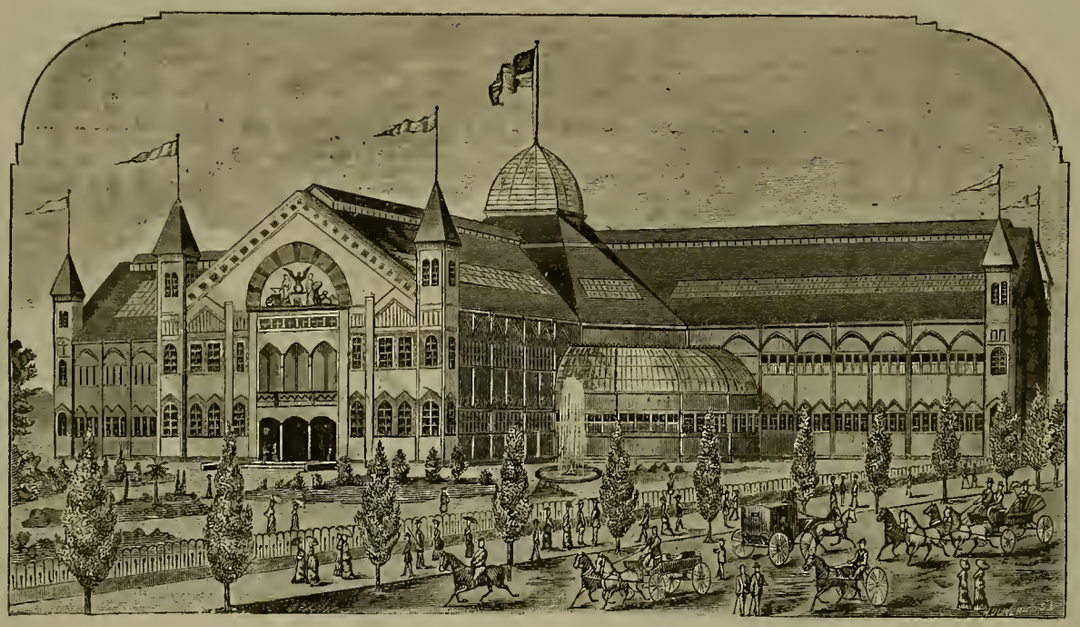
At the city election, held in March, 1883, the question of a special tax for new pavilion purposes, to raise $30,000, was submitted to a vote of the people of Sacramento, who decided by a vote of 3,655 in favor of, to 102 as against the proposition. A special levy of 30 cents on each $100 was made, and the $30,000 collected and paid into the treasury, together with $10,000 raised by the Directors, making $40,000—an amount equal to that appropriated by the State. The Board of Directors immediately advertised for plans, offering as a premium the sum of $300 to the successful plan. After considerable discussion and balloting, a design by A. W. Burrell, of San Francisco, was adopted. The contract was awarded to R. McKillican, of Oakland, for $74,363.

On the 5th day of June the corner-stone of the new building was laid under the direction of Grand Master Clay W. Taylor, of the Grand Lodge of Masons.

On the 22d day of January, 1884, the building was formally accepted from the contractor as completed, the time occupied in building this immense structure being eight months and six days. The building, as completed, contains 980,000 feet of rough lumber, 78,000 feet of rustic, 35,000 feet of wainscotting, 160,000 feet of flooring, 1,000,000 shingles, 56 tons of wrought iron, 12 tons of cast iron, 50,000 pounds of nails, 39,600 square feet of glass, 12,000 feet of gas-pipe, and 2,000 gas burners, including the art gallery jets. About 10,000 extra bolts, over and above those specified, have been used in the construction of the building.

The dimensions of the building, as it now stands, are as follows: From ground to top of flag-pole, 160 feet; from floor to peak of main trusses in dome, 108 feet; hight of dome, 40 feet; hight of towers, 88 feet; from ground to apex of roof, 80 feet; from the ground to eaves of building, 50 feet. As an extra precaution, lateral rods have been placed between each set of trusses, thereby tying the entire roof together. There is a rod of iron encircling the building on top of wall plates. The main building rests upon posts in each wing, set 28 feet apart, resting on piles driven 30 feet and capped with concrete. The dome rests upon four main posts, weighing six tons each, set upon three piles driven to gravel and capped by an 8 foot concrete base. The entire lower floor rests separately on 678 brick piers, set in cement, and is not attached in any way to the walls of the building. The 8-inch brick wall that fills in the space between the main posts merely supports six feet of the floor joist. The area of the building is as follows:

	Square feet.
Music hall	45,000
Horticultural hall	12,000
Machinery hall	12,000
Industrial hall	12,000
Art gallery	12,000
Conservatories	12,800
Promenade galleries	17,000
Total of floor space	124,800



STATE FAIR INDUSTRIAL AND AGRICULTURAL EXPOSITION BUILDING AT SACRAMENTO, CAL.

An executive session of the Board of Trade was held this week, to consider the depressed condition of affairs in this city and to provide some means to improve them. After a long conference a committee was appointed consisting of the Presidents of the Board of Trade, the Merchants' Exchange and the Manufacturers' Association, who are to be examined thoroughly into the causes that have produced the great depression in trade, and to suggest a remedy. They will be expected to hand in their report on the 17th of November next.

The largest dredging machine in the world has been finished at Potrero Point, and will be used on the Sacramento and San Joaquin swamp lands. She has been named Thor, and modeled after the best dredges now in use by De Lesseps on the Isthmus Canal, cutting out a channel and building a levee at the same time. The Thor is 101 feet long and 61 feet wide, and has 34 iron buckets, with a capacity of 1½ cubic yards each, which can be filled and emptied fourteen times per minute. All the machinery was manufactured in this city, and the timber is of Oregon pine.

The steamer *Barnard Castle*, from Departure bay, reports that the prospects in the new shafts of the Wellington mine property are much more favorable than the reports by telegraph would indicate. The new seams are about a mile and a half southeast from the mine proper, and show a fine quality and the best prospects for an abundant supply.

The public debt statement confirms the belief that the Treasury will not be compelled to resort to silver in settlement of clearing house balances: Gold coin and bullion has increased in the Treasury from $119,000,000 to $122,500,000. This increase is expected to continue during the fall months.

A gold quartz mine in Australia has paid to stockholders $2,685,000, in dividends, on a paid-up capital of $140,000.

New Milling Machines in Oregon.

During a recent visit to the Union Iron Works, Portland, Oregon, our agent was shown two machines of local invention that are worthy of mention in the PRESS. One was an ore and rock-breaker, the invention of Mr. E. W. Jones, the Superintendent of the Works. This machine is constructed upon a different plan from that of the ordinary rock-breaker. The main casting lies in a horizontal position, and is hinged upon a pivot at the back of the machine. It receives both a perpendicular and lateral motion by its other end revolving upon an eccentric, or small crank. A triangular shaped die, firmly set, at an adjustable angle, projects through a central cavity of the main castiug, and presents its two sides to the crushing surfaces of the moving crusher. This arrangement produces a variety of crushing movements at each revolution of the crank which gives motion to the machine, and an economy of power and time is effected which renders the breaker very effective and rapid in its work. The machine examined has a capacity of crushing from twenty to thirty tons of ore per day. If desired it pulverizes the rock almost to powder, and reduces the work of a quartz mill to a minimum. The other machine spoken of is a quartz mill invented by Mr. Salmon, and built by the Union Iron Works. Its peculiarity is a combined grinding and stamping motion, obtained by a revolving ring of stamps playing or moving within a proper casing or pan, motion to the stamps being given by a perpendicular shaft carried around upon the periphery of a 15-inch wheel suspended above. Thus the circular casting tips and revolves, much as a barrel might be made to tip upon its chime. Each of the stamps on the bottom of the circular ring presents a surface of 32 square inches to the die in the bottom of the pan. The combined weight of the stamps is 1,000 pounds. The sides of the pan are provided with screens for the exit of the crushed ore (water, of course, being used in reduction process) and what gold or precious metal is not amalgamated in the pan is saved by properly treating the pulp that escapes through the screens. The claimed advantages of this quartz mill are: Economy of power in running; thoroughness of the reduction of ore; and cheapness compared with stamps of like capacity. In conjunction with the rock-breaker above described, the mill has a capacity of seven to ten tons per day. We are promised perspective and detail cuts of these two machines, accompanying which we shall be able to present a more lucid description of their commendable features. Their invention and manufacture shows that Portland is awake to the interests of the mining industry which is becoming more naturally tributary to it than formerly.

The third annual exhibition of the National Mining Industrial Exposition, under the auspices of the Denver Chamber of Commerce, was formally opened in that city yesterday.

Electric Amalgam.

A company has been incorporated under the laws of the State of Maine, called the Electric Amalgam Company, which now owns the A. S. Hinckley patent. They manufacture what they call "electric amalgam," a compound which, it is claimed, will greatly assist amalgamation in gold and silver milling. An analysis by Torrey & Eaton, sent to Dr. John H. Rea, the agent, 7 Exchange Place, Boston, Mass., shows the sodium (electric) amalgam to contain two and one half per cent of sodium. They say, "We have used ten parts of common quicksilver on a small quantity of free gold ore and extracted five ounces per ton." By using eight parts of common quicksilver and two parts of the amalgam they extracted at the rate of thirty-six ounces per ton. It is claimed to be a simple and economic use of electricity for the purpose of increasing the activity of the quicksilver, keeping it bright and active.

The circular of the company states that electricity is stored in the quicksilver until the fluid mercury becomes a hard amalgam, similar to Wurtz's sodium amalgam, but differing in time, action and result. A small pellet of the new amalgam will last from 30 minutes to two hours. For pan or silver amalgamation, by using eight to ten ounces of the ordinary amount of quicksilver at the commencement, and using for the other two-tenths one pound of electric amalgam, dividing it into four parts, and feeding it at four equal installments, positive electric action will be had during the entire time the pulp is in the pan. There is no alteration of machinery necessary. The pellet or piece of amalgam is simply dropped in the mortar, pan or sluice box. It is claimed also that it will take up and amalgamate dirty or rusty gold. For preparing copper plates the instructions are as follows:

Wash the surface of the plate with a *weak* solution of *cyanide of potassium*, or soda, to remove any dirt, oil, or grease; take one or more ounces of mercury, add one-fourth the amount of electric amalgam, and mix thoroughly; take a piece of chamois skin, by preference, or a thin, soft rag, and rub in the mixture of mercury and amalgam on the plates. Five minutes will prepare a plate, even if entirely new.

Receipts of quicksilver at this port in August were 1,590 flasks, against 5,940 flasks for the same month last year, and 4,194 flasks for the same month in 1882. The deliveries last month were the smallest this year. The total for the first eight months is 17,975 flasks, against 32,120 flasks for the same time last year, and 30,609 flasks for the same time in 1882. Several of the mines in operation a year and two years ago have been closed down, and there is decreased product among the half-a-dozen in operation.

W. H. Cook will soon visit Los Angeles county in the interest of different papers published at this office. Mr. Cook has been a school teacher, comes well recommended, and from several months' connection with this office we do not hesitate to commend him to all whom he may meet, believing his efforts will be mutually beneficial to the papers and individuals, etc.

The first through train to Delta, on the California and Oregon railroad, left this city on Monday, and trains and stages and trains beyond that point are now running regularly, and this makes an overland route from here to Portland. The time required for the journey is about two and one-half days.

A large English party are now at the Trinidad, Mexico, and have the sale nearly completed of those mines at $1,500,000 cash. Brown Bros. & Co., of London, representing the English purchasers.

Vat Process for Silver Amalgamation.

From a paper by Edgar P. Rathbone, read before the Cardiff meeting of the British Institute of Mining Engineers, on the Francke "tina," or vat process, for the amalgamation of silver ores, we make some interesting extracts, omitting that portion relating to the ore dressing and roasting. The process is the invention of Herr Francke, a resident of Bolivia. It has, by its satisfactory working, entirely eclipsed all other plans hitherto tried in Bolivia, Peru and Chili. The Francke "tina" process is based on the same metallurgical principles as the system described by Alonzo Barba in 1640, and also on those introduced into the States in more recent times under the name of the Washoe process.

From the furnaces the roasted ore is taken in ore cars to large hoppers or bins, situated immediately behind the grinding and amalgamating vats, locally known as "tinas," into which the ore is run from the bin through a shoot fitted with a regulating slide. The tinas or amalgamating vats constitute the prominent feature of the Francke process. They are large wooden vats, from 6 to 10 feet diameter, and 5 feet deep, capacious enough to treat about 2½ tons of ore at a time. Each vat is very strongly constructed, being bound with thick iron hoops. At the bottom it is fitted with copper plates about three inches thick, and at intervals around the sides of the vat are fixed copper plates, with ribs on their inner faces, slightly inclined to the horizontal, for promoting a more thorough mixing. It is considered essential to the success of the process that the bottom plates should present a clear rubbing surface of at least 10 square feet. Within the vat, and working on the top of the copper plates, there is a heavy copper stirrer or muller, caused to revolve by shafting at the rate of 45 revolutions per minute. At Huanchaca this stirrer has been made with four projecting radial arms, but at Guadalupe it is composed of one single bell-shaped piece, without any arms, but with slabs, like arms, fixed on its under side, and this latter is claimed to be the most effective. This stirrer can be lifted or depressed in the vat at will, by means of a worm and screw at the top of the driving shaft. The bevel gearing is revolved by shafting connected with pulley-wheels and belting, the wheels being three feet, and one and one-half foot diameter and six inches broad. The driving engine is placed at one end of the building. Each vat requires from two and one-half to three horse-power, or, in other words, an expenditure of one horse-power per ton of ore treated. At the bottom of the vat, and in front of it, a large wooden stop-cock is fitted, through which the liquid amalgam is drawn off at the end of the process into another shallow-bottomed and smaller vat. Directly above this vat there is a water hose, supplied with a flexible spout, through which a strong stream of water is directed upon the amalgam as it issues from the grinding vat, in order to wash off all impurities.

The following is the mode of working usually employed: The grinding vat or tina is first charged to about one-fifth of its depth with water and from 6 to 7 cwt. of common salt. The amount of salt required in the process depends naturally on the character of the ore to be treated, as ascertained by actual experiment, and averages from 150 to 300 pounds per ton of ore. Into this brine a jet of steam is then directed, and the stirrer is set to work for about half an hour, until the liquid is in a thoroughly boiling condition, in which state it must be kept until the end of the process. As soon as the liquid reaches boiling point, the stamped and roasted ore is run into the vat, and at the end of another half-hour about one cwt. of mercury is added, further quantities being added as required at different stages of the process. The stirring is kept up continuously for from eight to 12 hours, according to the character and richness of ore. At the end of this time, the amalgam is run out through the stop-cock at the bottom of the vat, is washed, and is put into hydraulic presses, by means of which the mercury is squeezed out, leaving behind a thick, pulpy mass, composed mainly of silver, and locally termed a "pina," from its resembling in shape the cone of a pine-tree. These "pinas" are then carefully weighed and put into a subliming-furnace, in order to drive off the rest of the mercury, the silver being subsequently run into bars. About four ounces of mercury are lost for every pound of silver made. The actual quantities of mercury to be added in the grinding vat, and the times of its addition, are based entirely on practical experience of the process. With ore assaying from 150 to 175 ounces of silver to the ton, 75 pounds of mercury are put in at the commencement, another 75 pounds at intervals during the middle of the process, and finally another lot of 75 pounds shortly before the termination. When treating "pacos" or earthy chlorides of silver, assaying only from 20 to 30 ounces of silver to the ton, 36 pounds of mercury are added to 2½ tons of ore at three different stages of the process as just described. The rationale of the process therefore appears to be, that the chlorinization of the ores is only partially effected during the roasting, so as to prevent the formation of injurious salts, and is completed in the vats, in which the chloride of copper is formed progressively as required, by the gradual grinding away of the copper by friction between the bottom copper plates and the stirrer; and this chloride, subsequently becoming incorporated with the boiling brine, is considered to quicken the action of the mercury upon the silver.

Wood River Mining.

A Salt Lake *Tribune* reporter had the pleasure yesterday of meeting Mr. Shaughnessy, who is largely interested in Wood River, and has lately spent some time there. He looks upon that country as being a splendid mining district, and says we hear less of it this year than last, because the ores go to Omaha instead of coming here as formerly. He shows his faith in the country and mines by putting money in the development of his various mining properties there.

The Eureka mine, owned by him and Col. Wall, is to have the finest plant in the way of hoisting works, compressors, and concentrating mill in the West. Contracts have been let for the machinery, and the Eureka is to be worked from this on both winter and summer by a large force of men. The Eureka is known to be on the same ledge with the celebrated Idahoan, located on the east and worked from the opposite side of the ridge. The vein is a large one, and yields a fine grade of first-class ore, besides a large amount of concentrating ore. The mine is located up Eureka gulch, only a short distance above the town of Bullion. Across the gulch, on the same belt of mineral, are the Bates and Boyd mines, which are now producing well; beyond which is the Bay State group, owned by Messrs. Shaughnessy and Wall. The ledge has been cut by a 400-foot level, at a depth of about 400 feet, and they have commenced to take out ore.

Mr. Shaughnessy, one or two years ago, purchased the Emma mine, joining the Solace near Vienna, and upon this he is doing much work. The ore being extracted from the mine is very high grade milling ore, ranging from 300 to 500 ounces in silver. He is having boarding-houses, shops, etc., constructed and is laying in a quantity of necessary supplies for doing work through the winter, and will employ from twelve to fifteen men. In that locality mining underground is conducted to best advantage during the winter season, after ample preparations have been made. At that season the ground is free from water, and miners have no trouble from this source.

Private Letters from Bellevue,

Idaho, report a rich strike in the tunnel of the Queen of the Hills. The vein is the full width of the tunnel, and the ore is four feet wide, upon which drifting still continues, the workmen taking out ore only the size of the tunnel. This tunnel taps the veins at a point lower than any workings in the Wood River country, proving conclusively that the ledges there go down to great depths, and it is probable that the Queen of the Hills will prove as large a mine as any in that country. The machinery of the new concentrator has been tried and works splendidly, and the mill will be in full operation within a few days.

From the same source we learn that a good strike has been made on the Overland and that hoisting works have been erected on the property. The above mines are chiefly owned by Utah men, and we are pleased for their sake that the properties are promising so well.

Chinese Miners in Upper Columbia.

The Kittitas *Localizer* (No. 7) says: There are nine Chinese miners working a very profitable claim on the west bank of the Columbia, eleven miles above the mouth of the Wenatchie. Their average daily pay is $1 50 to the miner. The claim has been worked by them for the past twelve years.

There are two Chinese miners at work on the best paying Columbia river bar, opposite the Nez Spielum country. These miners are independent of any organization and are wealthy. The writer saw them take out ten dollars on a two day's wash by their improved Chinese process. They are protected by the Nez Spielum Indians, in whose interests they labor, and from whom they purchase their supplies.

Both banks of the Columbia are good for gold deposits, and are worked by Indians and Chinese throughout the entire length of bars, from the Nez Spielum to the San Poel.

There are five Chinamen at work on the east bank of the Columbia, opposite White Stone reserve. They too are independent and doing as well as the others. Frank Frielander has recently entered this claim, and has it recorded as the White Stone mining district.

There are twenty Chincse miners at work between Hawk creek and Camp Spokane, on the east bank of the Columbia. This is an old, well-paying claim, with very valuable deposits of fine gold in direct wash from the Coeur d'Alene and Spokane rivers. No paying bars north and east of the Spokane.

On the Rock creek mining district, near Kettle river, and between lake Sooyoos and Kettle falls, near the British Columbia line, there are nearly 200 Chinamen at work, with Indians and other old frontier miners. This is an old mining district, equal in extent to that of the Kootenai country. Average daily pay, about two dollars.

The Similkameen mines are resting; no machinery, and no capital to develop them.

The Martin White Mine.

From the report of the Superintendent of the Martin White mine, Nev., for the year, we take the following extracts:

During the past year our explorations have been confined mainly to the southerly portion of the lead, on and above the 160 level, partly in what is known as the F. F., from the upper workings of which a raise was run through the Truscott ore body to the surface. In doing so we extracted a fair amount of ore of very good grade.

Considerable prospecting was done along the lime wall under this body, and some veins of high-grade ore were encountered.

Owing to the immense amount of snow which, melting, so flooded this part of the mine, the work was necessarily suspended until the ground became settled.

Prospecting was then resumed on the 160 level in another part of the mine not so affected by the water, and some good ore was extracted. The most of these developments were of a very encouraging nature.

In all there was run during the year about 1,450 feet of drift, 170 feet raise and 60 feet of shaft. In doing this we extracted about 250 tons of ore of about the assay value of 41.32 ounces in silver per ton.

The past year, although by no means barren of good results, has been one of disappointments and misfortunes (in a small way).

The F. F., notwithstanding our best efforts to prevent it, closed up from the great weight of the thoroughly soaked ground. The drift from the cave on the surface also closed up, thus shutting off all communication with the body. The body itself, from the giving way of the worked-out ground underneath in some places, caved to the surface. These misfortunes necessitated the running of a new drift from the surfaces. This drift will tap the east drift in about 150 feet.

The chamber around the top of the main chute, from the unusual height, also gave way.

I have done a large amount of repairing and timbering, as the old timbers were constantly giving way. I now have the mine secure, and not much re-timbering will be necessary for some time probably.

Buried in a Mine.

W. T. Newberry, who has been running a tunnel in Blue Point ravine, about one mile and a half from the Mountain House, on the Forest City road, had a miraculous escape from death recently. Newberry has been working alone in the tunnel, which is in a distance of some fifty feet. He started out to work and his failure to return in the afternoon was overlooked by those around the Mountain House, and it was not until the return of Dan Cole in the evening that his absence was thought of. Finding that Newberry had not been seen since the morning, Cole dispatched a man to the tunnel, who returned with the information that the tunnel had caved. On receiving the news, several men started for the scene of disaster, while a telegram was sent to Forest City asking for help. The request was promptly responded to, and a number of men with the necessary implements were soon on the ground. The tunnel had been poorly timberd, and the whole top from near the mouth to the face had come down, as was evident from the appearance of the ground on the surface. The work of opening the tunnel was necessarily slow and was anything but a safe place to work in, as the ground was broken to the surface. However the men kept steadily at work.

About 2 o'clock the following afternoon the men were rewarded by hearing the voice of Newberry. Work then went on with renewed energy and shortly after 3 o'clock the imprisoned men was rescued from his perilous position.

The debris from the cave extended right up to where he stood. Newberry was very weak and somewhat dazed when taken out, but aside from this he was all right. He reported the tunnel to have caved about 10 o'clock Saturday morning, so that he was imprisoned about twenty-nine hours. He says that he heard the workmen as soon as they commenced to work, but could not tell whether it was rescuers or more caving of the tunnel.—*Downieville Tribune.*

THE FARRINGTON MILL.—Work upon the new mill of Farrington & Moss, situated about eight miles from the mines in Garfield district, in this county, has progressed so far that the machinery will be in operation within a short time. It is learned from one who is competent to judge of the methods of reducing the ores of this part of the country, that the little mill of five stamps will be the most complete ever erected in this State. Only the most modern and best working machinery has been put in, and not a shovelful of the ore will be handled from the time it enters the rock-breaker until placed in the pans. Besides, the machinery is all so closely connected but a small force of men will be required to operate it. Ample precautions have been made against fire by a system of pipes extending all over the building, and a sufficient supply of water is conveniently near at hand. There will be plenty of wood, which can be delivered at the mill for from $4 to $5 a cord.—*Candelaria True Fissure.*

ARIZONA MINES.—The Prescott *Courier* says: We can think of no better advice to give to owners of promising mines than to keep on developing them. If owners cannot have their ores treated at home, they can ship the richest of them and save the remainder, for future reference, so to speak. There are in Humbug, Black Canyon, Tiger, Turkey Creek, Hassayampa and, in fact, all other districts of the county, bodies of rich ores that can be mined and shipped at a profit, and it is to such mines we now look for pay. In proof of this assertion, we can point to the Pine Spring, the Holmes, Blue Dick, Mark Twain, and Dosoris mines; also to a great many others, notably those near the Tip-Top. Could we but procure and publish results of milling and smelting in this part of Arizona, the figures would be very satisfactory, but those who have done well, and are doing so now, do not "hanker after notoriety." These are the United Verde company, the Black Warrior company, Kimball company, Chicago company. We might save others, but the foregoing will answer every purpose. We have, in reserve, the Bradshaw Basin mill, which Bond & Hayden are fixing for work; and the Del Pasco. There is talk of erecting general reduction works in Copper Basin.

THE OLD TRENCH MILL.—Theodore Vinson, of Silver City, was in town yesterday. He has long been engaged in cleaning up and working the debris at the site of the old Trench mill, but the work is now drawing to a close. A great deal of valuable material was found. The mill was started up about twenty-three years ago, and some idea of the amount of slopping and drippings of quicksilver and amalgam that would accumulate in the ground and all about the place in that length of time may be formed particularly by millmen. There in the early days they were rather "slushy" at best, and much addicted to processes and experiments of all kinds. In front of the old Trench we have seen them for months roasting the rich ores of the Comstock on log heaps, and they were wont to dose the pans with teas made of cedar bark and sagebrush, salt by the bushel and blue-stone by the peck. *Virginia Enterprise.*

A NEW SLUICE-BOX.—Messrs. Bacon and Cooper, the two well-known assayers, left this morning for their claim on Snake river, about 15 miles from Bliss railway station, where they will start work at once. They took along with them a new kind of amalgamator, for which a United States patent was issued May 27, 1884. This new amalgamator is a sluice-box, having opposite riffles faced with copper plates that can be amalgamated, and, when necessary, connected with wires leading to a generator of electricity. The riffles are so placed as to cause counter-currents, and to throw every part of the matter passing through in contact with the plates. The amalgamator has been tried at the Ontario mill and elsewhere, and is highly extolled by all mining men who have seen it. If it works half as well as it is expected, it will solve the problem of how to save the flour gold of the Snake river placers.—*Wood River Times.*

A GOOD FIND.—The Elko *Independent* says: Thomas Schaffer, of Tuscarora, who had been here some eight or ten days, was joined by William Hoar, who came down by stage on Saturday evening, and they together started by the train Sunday morning for Beowawe, from which place they go to examine an old mining claim located by Schaffer several years ago, some ten miles east of the present camp of Frisbe, and situated in the Toiyahe range. Schaffer says that in the claim mentioned he uncovered an eight-foot vein of mineral bearing quartz which gave assays all the way from $19.50 to $800 per ton, the average value being very high. Schaffer showed us a sample of a very handsome piece of ore from the lead in question, and if the miner's enthusiasm has not warped his judgment, the claim will develop into something exceedingly valuable.

ANOTHER MEADOW LAKE REVIVAL.—The Sierra Valley *Leader* says H. H. Hartley, the present inhabitant of the once famous Meadow Lake mining district, was in the valley last week, and made contracts for lumber with which to erect a new quartz mill with improved machinery in that district. Mr. Hartley has been in Meadow Lake for nearly twenty-five years, and has an abiding faith in that country. Rumor says he has been successful in his persistent efforts and has made money of the country, so that he now intends to put up a mill on his own responsibility and on his own plans, which, by practical experience, he is satisfied will work the refractory ore successfully.

ANOTHER POSTAL IMPROVEMENT.—In order that Eastern mails may be delivered in this city an hour earlier than at present, seven postal cars have been refitted so as to facilitate the work. When each western bound train arrives at Sacramento, two postal clerks sent up for the purpose will board the postal car and distribute the San Francisco mail according to street and number, so that it can be turned over to the carriers immediately upon its arrival. This arrangement will go into effect as soon as the cars have been completed.

ENGINEERING NOTES.

One Hundred and Forty-seven Miles Without a Stop.

The New York Central and Hudson River Railroad is running special newspaper trains to Albany. A large engine has recently been fitted up on that road for fast trains. It has also had a new device attached to the furnace for consuming its smoke. The smoke consumer is very simple, consisting merely of two pipes, one in front of the fire-box, and one in the rear, each of which admits jets of steam into the flames rising from the burning coal. The steam effects perfect combustion, and while completely consuming the smoke, makes a gain also in the heat obtained. Usually, when the fireman is throwing in coal or stirring the fire, and for a few moments after each operation, a cloud of smoke pours from the chimney of the locomotive. In the whole trip to Albany nothing that was visible came from the chimney except the escape steam. The improvement was wonderful, and the Central officials seem to be justified in feeling that they are a little ahead of the rest of the world with their new device. So far only two or three locomotives have been supplied with the smoke consumers, but others are to be soon.

The trip to Albany was also noteworthy because the engine ran the whole 147 miles without stopping for water, oiling up, or anything else. The company are aiming to introduce this idea in all their fast trains. To run an engine so far without oiling requires alterations in the oil cups, etc., but all the difficulties have been overcome, and the long run was made successfully. Water was obtained by the well-known method of "scooping up" while in motion.

ANOTHER ELECTRICAL RAILROAD EXPERIMENT. A practical trial was made at Cleveland, Ohio, on the 20th ult., of an electric motor for street cars, the Brush Electric Works, in connection with the East Cleveland Railway Company having fitted up about two miles of track and attached a motor to the car. The general scheme is much like that of a railroad, the electricity being conducted through rods laid in a trough in the center of the tracks. A lever reaches down in the center of the track into this trough and attaches to the electrically charged rods. The experiment was considered a success, the car moving off at the first swing of the lever. There seemed to be some stiffness in the machinery, but this, it is claimed, will be overcome. The railroad company state that they expect to at once apply the motor to the whole line. It is claimed that the road can be operated with electricity at one fourth the cost of working it with horses.

TRANSMISSION OF POWER BY ELECTRICITY.—One of the most remarkable instances of the transmission of power by electricity is that presented by the electric railway in one of the main cross-cuts of the Oppel colliery, Saxony. This cross-cut is 2,365 feet long, and is the outlet for the coal mined in the vein, the quantity delivered to it being 600 mine-cars per day of 16 hours, each car weighing, loaded, 1,594 pounds. A train of 15 cars is moved at a speed of from seven to 10 feet a second, the steam-engine at the mouth of the shaft making from 225 to 250 revolutions during the run, lasting from three and one-half to four and one-half minutes through the cross-cut. When doing this amount of work, the steam-engine delivered 11.2 horse-power; or, assuming the friction of the engine's gearing to have occasioned a loss of twenty-five per cent, the power actually transmitted by the electric current to the locomotive was 5.22 horse-power, or 46.6 per cent.

TWO GREAT ENGINEERING PROJECTS are about to be undertaken on the continent. The Spanish and French governments have agreed to authorize the construction of two new railways which will involve the cutting of two tunnels through the Pyrenees. The one will shorten the route between Paris and Madrid; while the other will give France speedier access to ports in the east of Spain, whence she could most expeditiously despatch relief to Algiers.

RAILWAY CONSTRUCTION in the United States continues on a very conservative basis and the new mileage thus far this year is smaller than for the corresponding period of any previous year since 1879. This shows that there is no disposition to build new roads in advance of the wants of the people, and is important insomuch as it will give the country a chance to grow up to roads already constructed.

CALIFORNIA AND OREGON EXTENSION.—The last bridge across the Sacramento river, on the California and Oregon Extension Railroad, to the new terminal town of Delta, has been completed, and it is expected that the road and all necessary adjuncts will be in running order by September 1st.

IT is stated that the Union Pacific Railroad has completed the surveys of a line to the Yellowstone national park. The route is from China Point, Idaho, on the Utah and Northern Division, to and up the Snake river, thence across the Rocky Mountains to Madison river. The distance is 275 miles.

USEFUL INFORMATION.

Silvering Iron.

A manufacturer in Vienna employs the following process for silvering iron. He first covers the iron with mercury, and silvers by the galvanic process. By heating to 300° C., the mercury evaporates and the silver layer is fixed. Ironware is first heated with diluted hydrochloric acid, and then dipped in a solution of nitrate of mercury, being at the same time in communication with the zinc pole of an electric battery, a piece of gas carbon or platinum being used as an anode for the other pole. The metal is soon covered with a layer of quicksilver; is then taken out and well washed and silvered in a silver solution. To save silver the wire can be first covered with a layer of tin; one part of cream of tartar is dissolved in eight parts of boiling water and one or more tin anodes are joined with the carbon pole of a Bunsen element. The zinc pole communicates with a well-cleaned piece of copper, and the battery is made to act till enough tin has been deposited on the copper, when this is taken out and the ironware put in its place. The wire thus covered with tin chemically pure and silvered is much cheaper than any other silvered metals.

VEGETABLE SILK.—A German technical journal gives some details as to a vegetable substance, somewhat resembling silk, to which attention has lately been drawn by its having been exhibited in Greece. It is stated that this substance is a silky haired portion of a tree like shrub, which came originally from America, but is found in Syria and the south of Europe (*Asclepias Syriæ*), of the family of Asclepiades. It is also known as the Syria silk plant. The substance in question is used for stuffing very soft cushions. When mixed with silk and wool, the Syrian silk is said to be used in different tissues. The milky juice of the plant is poisonous, and the tough stalks can be used in the same manner as the corresponding portions of the hemp plant. An English exchange, which has seen a specimen of this fiber, says: "It is certainly very beautiful, soft to the touch, and very silky in appearance. Whether it is likely to be used largely for manufactures is quite another matter, upon which no off-hand opinion would be worth much.

THE LARGEST SKY-LIGHT.—The sky-light in the new building of the Board of Trade in Chicago, will be the largest in the United States, and will be constructed by a manufacturer of that city. Its dimensions will be 60 by 68 feet, divided into 225 parts 46 inches square. It contains very little color, the problem presented to the artist being the greatest possible amount of light combined with the highest ornamentation. The figures are rich in coloring, but slender and serpertine, the ground being nearly white. The glass is partly Venetian, partly cathedral, and partly opalescent, one-eight and one-sixteenth of an inch in thickness. The sky-light will be finished by October 15th, and will cost about $5,000.

GLASS COATING ON METALS.—The following method has been suggested for coating metallic surfaces with glass, which may be found to answer various purposes. Take about 125 parts (by weight) of ordinary flint-glass fragments, 20 parts of carbonate of soda and 12 parts of boracic acid, and melt. Pour the fused mass out on some cold surface, as of stone or metal, and pulverize when cooled off. Make a mixture of this powder with silicate of soda of 50 B. With this coat the metal to be glazed and heated in a muffle or other furnace until it is fused. This coating is said to adhere very firmly to steel or iron.

LABELS can be glued on tin boxes, etc., exposed to moisture by the following process, and they will not come off, even if dipped or allowed to remain in water: The white of an egg should be mixed with half as much water, or the dessicated albumen of commerce dissolved in two or three times its weight in water. Apply with a brush to the surfaces to be united; then iron with a very hot flat-iron. Several layers of paper and a glue thus treated will render any box or anything of the kind impermeable to the water.

TO SOFTEN A PAINT BRUSH.—When a paint brush is stiff and hard through drying with paint on it, put some turpentine in a shallow dish and set it on fire. Let it burn for a minute until hot, then smother the flame and work the pencil in the fingers, dipping it frequently into hot spirits. Rinse all paint brushes, pencils, etc., in turpentine, grease with a mixture of sweet oil and tallow to prevent them from drying hard, and put away in a box out of the dust.

THE MOSQUITO'S INSTRUMENT OF TORTURE.—A writer in the London *Sportsman* thus describes a mosquito as seen under a microscope: It appears that in the "bill" of the little beast alone there are no fewer than five distinct surgical instruments. These are described as a lance, two neat saws, a suctious pump, and a small Corliss engine. It appears that when a "skeeter" settles down to his work upon a nice tender portion of the human frame the lance is first pushed into the flesh, then the two saws, placed back to back, begin to work up and down to enlarge the hole, then the pump is inserted, and the victim's blood is siphoned up to the reservoirs carried behind, and finally, to complete the cruelty of the performance, the wretch drops a quantity of poison into the wound to keep it irritated. Then the diminutive fiend takes a fly around just to digest your gore, and makes tracks for a fresh victim, or if the first has been of unusual good quality he returns to the same happy hunting ground. The mosquito's marvelous energy, combined with his portable operating chest, make him at once a terror and a pest.

KEEPING WOOD IN MOIST GROUND. A Brooklyn (N. Y.) carpenter writes that in 1864 he laid down some old painted half-inch door panels as a flooring for a coal bin at the rear of his yard, and that, on taking them up seven years afterward, they were just as sound as if they had been but recently cut from a thrifty living tree, although so pliable with moisture that he could have bent one of them around a six-inch stove pipe. Our correspondent suggests that the painting of railroad ties, or coating them with white lead and oil, would be very efficacious for their preservation.

STAINING RATTAN CHAIRS.—Wash the rattan with a concentrated aqueous solution of iron acetate, having a strength of 14° Baume. Repeat this until a desirable shade is produced; then give a coat of quick-drying varnish, such as can be made by dissolving black wax in spirits of wine.

A NEW LUBRICANT.—A Dresden man has made a good lubricant for shafts by mixing the whites of eggs with the finest graphite powder to the consistency of firm dough. This is kept in boiling water till the whole is coagulated. The mass is then reduced to powder.

THE TALLEST HOUSE. The tallest flat house in New York has 10 full and 3 attic stories in front, 15 stories in the rear. It is 170 feet high. There are many of 12 stories, from 140 to 150 feet high.

SUBSTITUTE FOR HUMAN HAIR. A substitute for genuine human hair is now made out of the inner lining of the bud of the palmetto tree. It can be made of any length and dyed any color.

THE TRUCKING BUSINESS.—Thirty thousand two-horse trucks are employed in the business of New York City. Upward of $20,000,000 are invested in this industry.

LINKS AND PINS.—It costs annually $1,200,000 for links and pins for the freight cars in this country.

GOOD HEALTH.

A Chapter on Arnica.

A bottle of arnica in the house, especially when one lives remote from drug stores and physicians, will frequently prevent serious trouble. Indeed, I think a judicious use of arnica would, in many cases, prevent that dreaded culmination of so many wounds—lock-jaw.

Experience has been my teacher in the use of this remedy, and I will relate two incidents in my own family, and I could cite many more, both in my own and in families of my neighbors. My boy, while engaged in a game of ball, ran with full force against a fence of barbed wire. Reaching out his hands, he caught the points in his fingers, tearing the flesh nearly to the bone, making a jagged wound.

I at first bound up his hand in carbolic salve, but the next day found the wound had an unhealthy appearance. I was a little alarmed, and consulted my medical work, and found arnica was the remedy. I immediately applied it, with most satisfactory results, the wound soon assuming a healthy appearance and quickly healing.

Another time, that same boy was trying to domesticate a hawk which he had fired at and wounded, and in an unguarded moment the hawk thrust his talons nearly through his hand. It was impossible to pull them out until he placed his heel firmly on the bird's head, when his hold relaxed and we drew out the claws, leaving some ugly wounds.

I quickly bathed the hand in warm water, then bound it up in arnica. It healed rapidly and almost without pain. Being a homeopathist, I also give a few doses of arnica internally, which aids the cure.

I prepare my own tincture in the following manner: I buy two bits worth of arnica flowers of the druggist, put them in a glass jar, and pour over them one quart of alcohol, adding more alcohol as I use it, until the strength of the flowers is all extracted.

Before using I dilute the tincture to about one part arnica to four parts warm water. For cuts and wounds where the skin is broken, bathe around the injured parts, then bind up with a cloth dampened with the arnica, repeating as often as may be required by the pain.

For bruises bathe freely and bind up with a cloth wet with the arnica. It allays the pain, removes the soreness and causes wounds to heal rapidly.

If an eruption appears while using it, or there is a tendency to erysipelas, some other remedy must be resorted to. My medical work recommends the use of calendula (the common marigold), but as arnica has been the sovereign remedy in my family and community, I have had no occasion to try any other.

J. M. H.

Tar and Turpentine in Throat Disease.

Impregnation of the atmosphere of a sick-chamber when the patient is ill of diphtheria, measles, scarlet fever, or of any allied disease, with the odor of a mixture of equal parts of turpentine and carbolic acid is recommended by Dr. Vilandt. Half a teaspoonful of the mixture will be enough at a time, if it is put into a kettle of water kept near the boiling point. The odor generally gives some relief to the sufferer, and tends to prevent the spread of the malady.

Dr. Delthil reports to the French Academy of Medicine wonderful cures of membraneous croup and diphtheria by the use of the vapor of liquid tar and turpentine. Dr. Delthil's process was described. He pours equal parts of turpentine and liquid tar into a tin pan or cup and sets fire to the mixture. A dense resinous smoke arises, which obscures the air of the room. "The patient," Dr. Delthil says, "immediately seems to experience relief; the choking and rattle stop; the patient falls into a slumber and seems to inhale the smoke with pleasure. The fibrinous membrane soon becomes detached, and the patient coughs up microbicides. These, when caught in a glass, may be seen to dissolve in the smoke. In the course of three days afterwards the patient entirely recovers."

Dr. Nichols tried this treatment with little Ruth Lockwood, daughter of a printer in the New York *Times* office. She was lying gasping for breath when he visited her. First pouring two tablespoonfuls of liquified tar on an iron pan, he poured as much turpentine over it and set in on fire. The rich resinous smoke which rose to the ceiling was by no means unpleasant. As it filled the room the child's breathing became natural, and as the smoke grew dense, she fell asleep.

BOWEL COMPLAINTS.—For even severe cases of stomachic and bowel troubles incident to warm weather, a medical writer recommends the following simple preparation, after having used it with very satisfactory results in his own family and elsewhere for many years, viz.: Take equal parts of laudanum, syrup, rhubarb, spirits camphor, essence peppermint, and one-half part of cayenne pepper. Dose, from one drop to teaspoonful, according to age, and given from ten minutes to ten hours apart, as severity of the attack may require. Leaving out the red pepper, it may be given to infants only a day old, in one-drop doses, morning and evening. Of course *common sense* should accompany the mixture. The small amount of laudanum need not be feared, and neither the above nor any other medicine should be given children unless absolutely necessary. For colicky infants the above is far preferable to any of the "soothing syrup" poisons so freely used.

A BUG IN THE EAR—HAPPY THOUGHT.—A few weeks since, one of those snapper-bugs flew in at the open window and lit on the ear of a gentleman who was asleep, in the city of Macon, Ga. The bug entered the ear and commenced his snapping and tearing at the delicate lining of the ear with its claws. The snapping sounded like the beating of a thousand sledge-hammers, and the clawing caused almost insupportable pain. The bug was too far in to be pulled out by the fingers, and the gentleman arose and his wife tried in vain to get it out with a needle and a hair-pin. At last he resolved to go to a doctor, and while dressing himself his wife happened to think of the attraction light had for bugs and moths. She placed the lamp near the ear, and in less than half a minute the bug crawled out backward with the blood oozing from the ear.

STRENGTH OF THE ANCIENTS.—Physical superiority of the ante-Alexandrian Greeks to the hardiest and most robust nations of modern times is perhaps best illustrated by the military statistics of Xenophon. According to the author of the "Anabasis," the complete accoutrements of the Spartan soldiers, in what we would call heavy marching order, weighed 75 pounds, exclusive of the camp, mining and bridge-building tools, and the rations of bread and dried fruit which were issued in weekly installments, and increased the burden of the infantry soldier to 90, 95, or even to fully 100 pounds. This load was often carried at the rate of 4 miles an hour for 12 hours per diem, day after day, and only in the burning deserts of southern Syria the commander of the Grecian auxiliaries thought it prudent to shorten the usual length of a day's march.

A FLY'S BITE.—W. J. Barry, a wharfinger at section 4 of the seawall, in this city, a few days since, felt a stinging sensation of the right hand, and noticed a yellowish colored fly trying to make a meal at the seat of pain. The fly was brushed off and nothing more was thought of the matter for an hour or so. At the expiration of that time, Barry noticed his hand had swollen considerably, and the member during the afternoon had increased to twice its natural size, necessitating the services of a physician. The victim thinks the fly had taken a sip of water from the stagnant and loud-smelling pool back of the seawall, and that some of the poisonous liquid had been injected into the blood.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

BUTTE CREEK.—Amador *Ledger*, Aug. 28: The contract for sinking the Mahoney shaft 100 ft deeper has been completed. The contractors have done very well by the job, realizing about $3½ per day, after paying all expenses. This brings the shaft to a total depth of 1000 ft. A force of men are now at work lowering the pump and doing some necessary repairs to the shaft. When this is completed, which will be in a few days, drifting at the 1000 ft level will be pushed ahead. A few additional hands have been put to work in the Amador Consolidated, preparatory to the commencement of sinking operations. William Johns, who is Superintendent of several mines in Plumas county owned by English capitalists, has been here for several days for the purpose of testing the new pumping apparatus, operated by water power, the invention of Mr. Knight. The pump has been made expressly to order for the Eureka mills, Plumas county. The test proved entirely satisfactory. The machinery will be shipped in a few days. It will weight several tons.

El Dorado.

THE HOUX AND SAILOR JACK MINES.—*Mountain Democrat*, Aug. 28: The Grays and Bosquit are vigorously working the Houx mine, located at Gray's Flat, in White Oak township, with very flattering prospects. The ledge is wide and strong and the ore the best ever taken out of a regular ledge in that vicinity. At the Sailor Jack mine the same parties are opening a new road, so as to let them into the mines with timbers and other materials needed, when a force of miners will be put to work.

Inyo.

ARGUS RANGE.—Inyo *Independent*, Aug. 30: Last Wednesday Mr. White, of Darwin, brought in to Keeler a bar of silver bullion, valued at $1,800, the product of 10½ tons of ore from the Argus Range mines. The ore was milled at the Riley mill, and although the expense for hauling it is great, a handsome profit is still left to the miner. With the natural facilities existing close to the mine, a mill could easily be built and run that would make the State Range very valuable property. There is a large amount of ore similar in quality to that from which this bullion was obtained, and these united advantages cannot fail to induce some parties to take hold of the property who are able to make the necessary improvements.

HAWLEY MILL.—The Hawley mill was started on Tuesday of last week, and has been running steadily since. A correspondent says: "I can assure you, though heavy, yet it is welcome music made by the dropping stamps in the Hawley-Keeler mill once more, and on ore that will beyond doubt prove profitable to the owners, and renew the fame of Cerro Gordo and the Inyos."

PINE MOUNTAIN.—At Pine Mountain, Mr. Roberts has 8 men at work in one of his claims, and will soon begin shipping ore to San Francisco. He has a lot of ore now ready, and will have it packed out to the railroad without delay.

MAMMOTH.—Is not entirely dead. Several men worked there during last winter, and are still working, taking out ore, and at present running an arastra. Mr. Townsend passed through here the other day with some bullion for shipment. He predicts a "hoom" for old Mammoth yet.

LAUREL HILL.—Mr. Maxwell, of Laurel Hill district, was in Round Valley to-day. This gentleman, with others, has been operating in Laurel (this district is southeast of Mammoth, and overlooking Long valley) for six years. He says that they have ore there assaying from $25 to $100 per ton, and some of it must and will be "squirched" before long.

ROUND VALLEY MINING MEN.—Messrs. Brooks and Sherwin, of this valley, are jubilant just now over a new discovery called the "New Boom." The organization of a new mining district is being agitated, which will take in the old French district, Rock Creek mine, and all the detached hills south of Round Valley.

Mono.

STANDARD CON.—Bodie *Free Press*, Sept 1: Extracted and shipped to the mill 552 tons of ore and 590 tons of tailings. Received from the ore 630 ounces of crude bullion and from the tailings 435 ounces. Shipped to the company this day $16,004.92 of which $11,209.28 is from two weeks' run on ore and $4,795.34 from two weeks' run on tailings.

BODIE CON.—At the mill 190 tons of tailings were worked, the average assay value being $7 per ton. All in and about the mine is working well. Thirty-seven men are employed.

CON. PACIFIC.—Since last report the drift on Pacific ledge No. 1 has reached a distance of 42 ft from the chute. Rock still hard. Ledge keeping an average width of 16 inches and yielding some good milling ore.

Mariposa.

HORNITOS.—Cor. Mariposa *Herald*, Aug. 29: Mr. Hulings, our moneyed man, is expectly hourly, and when he arrives it is thought our mining interests will loom up. Some ill-feeling has been engendered between miners and land-owners in this vicinity, by prospectors prospecting on pre-empted land. The owners of the Duncan mine have moved their machinery and built a commodious house on the north side of their claim with the expectation of striking some very rich pockets, as it is well known that the Duncan mine is the richest mine in this section of the county. The owners of said mine deserve much credit for their perseverance and energy in developing the same.

Placer.

QUARTZ INTERESTS.—Placer *Herald*, Aug. 30: There is rather more prospecting going on just now on the quartz ledges of this section than for some time, and the developments are most invariably of an encouraging character. Holden & Smith have for some time been working a lead out near the Chinese graveyard, and, from all accounts, their rock is fabulously rich. We have seen quite a number of specimens from their mine, and all of them show free gold in profusion. It is indeed a specimen ledge, and yet the rick streak, as they have demonstrated by different shafts, is quite extensive. Messrs. Norton and Hooper are working the old Crœsus ledge, on Baltimore ravine, on a lease, and their prospect is said to be very encouraging. Mr. Totten, whose mine is also near Baltimore ravine, has associated with himself some Eastern parties, and is preparing to erect such works as will be necessary for the thorough development of the lead. This ledge has turned out some rich quartz, and good results are confidently expected when the works are completed. Chas. Reed and Thos. Oats have been reopening and working the old St. Lawrence recently, and they are meeting with good results. They have a ledge of all milling ore that averages 2 ft and 3 inches in thickness; and a crushing of 15 tons at the Pelster mill, run through the latter part of last week, averaged $20 per ton. Jacob Kaiser, who has been working a ledge near North ravine, lately had a crushing at Pelster's mill, from which he realized $600. One or two ledges on Duncan hill are also being opened systematically. Altogether, quartz mining in the district seems to be somewhat reviving, and the almost universal success of those now operating is likely to have the effect of giving even greater stimulus to the business.

A PROMISING NEW QUARTZ MINE.—The Big Oak Tree quartz ledge, parallel to and not far from the late famous Rising Sun mine, in Colfax district, bears indications of proving as rich as the Rising Sun has been. It is owned by Wm. Werry, Joseph Werry and Phil. Nicholls. The last two, Joseph Werry and Nicholls, have recently bonded their interest to Mr. Greyson, of Oakland, and it is the intention of Greyson and Wm. Werry to proceed at once to a thorough development of the mine. The ledge is of good size, and, so far as prospected, the rock pans out surprisingly well.

Sierra.

A HOG CANYON QUARTZ MINE.—Sierra *Tribune*, Aug. 30: W. R Chamberlin, of Reno, paid a visit to Hog canyon last week. He is interested in a quartz ledge there with L. J. Flint and J. D. Fagg. The mine is being developed under the supervision of Mr. Fagg. Some very fine prospects have been obtained and the owners feel in the best kind of spirits over the outlook of their property. They have secured the use of the Lamping mill and in a short time will begin crushing ore. A track has been laid to connect the mine and mill. Parties who are informed tell us there is a fine country prospect in for quartz up that way.

SOL. WOOD'S PROSPECT.—From all accounts Sol. Wood has found a big thing in the quartz line in the vicinity of Butcher ranch. He is sinking a shaft on the ledge at present, and although he don't make much fuss about it, has obtained some splendid prospects. Mr. Wood used to be interested in the Four Hills mine with our friend Stephen Spencer. Both of these gentleman sold their interests in that claim and the present owners who purchased of them struck the rich body of ore only four ft from where the former parties had quit work.

NEW LEDGE.—*Mountain Messenger*, Aug. 30: R. D. Williams, of Jim Crow canyon, has discovered a new ledge near the one he has been working heretofore. It is higher up the hill, and bids fair to be richer than anything ever discovered in that vicinity. John Barton is digging a new ditch for his claim on Crayeroft Hill. J. B. York has got his lower tunnel in to the ledge, which is from 4 to 5 ft in width at this point, and prospects well. He is now prepared to get rock cheaply and expeditionsly. The North America gravel mine, Hepsidam, is yielding very good returns this year. Taylor & Forbes are getting out the iron-work for the new 40-stamp mill for No. 9 tunnel at Sierra City. A very fine prospect in coarse gold has been obtained on the headwaters of Canyon creek by a man named Scott. He has good indications of a channel. The Extension Co. are now raising a chute for gravel, at the end of their main tunnel, 5,900 ft from its mouth. The rock is good and the prospects of raising in the channel are favorable. Geo. Hardy has located a deposit of iron ore on the wagon-road, about six miles above town. The specimens appear to be rich and the deposit extensive, and it is so situated as to be very easily got at.

Shasta.

SOUTH PARK.—Cor. Shasta *Courier*, Aug. 30: Bids are being received for running the lower tunnel at the Crystal. This will tap the ledge 100 ft from the surface. The water interfered with work in the shaft where work will be discontinued until the tunnel is fully completed. Two tons from the ledge have been shipped below for testing. This will give a fair sample of the ore at the bottom of the shaft—70 ft below the croppings. A shaft is to be sunk 40 ft on the Dayton. Preliminary work is now being done with that object in view. Robinson & Co. are getting some good ore from their "Cooper Ledge," and getting the mine in shape to work more economically than at present. The ore is crushed in their cannon ball mill. Their new concentrator gives satisfactory results. E. L. Ballou's arastra is running on Manzanita ore. The mine is looking well and an abundance of good ore in sight. D. H. Hubbard and partner are running their arastra on Pacific ore. Wright & Ormsly are also running their arastra.

Tuolumne.

AT WORK.—Tuolumne *Independent* Aug. 30: Dave Levy, Superintendent of the Old Tuolumne quartz mine, above Columbia, reports work going on lively. Hoisting works erected, with house machinery in place, and pumps, which will be run by a Knight wheel, under 300 feet pressure. A great deal of grading and excavating has been done, the main working shaft has been re-timbered to the depth of 160 ft, and all preliminary work is being pushed to rapid completion. Six men are now at work and in a short time it is expected the force will be largely increased.

NEVADA.

Washoe District.

OPHIR.—Virginia *Enterprise*, Aug. 30: On the 250 level some ore is still being extracted from the fillings of the old drifts.

MEXICAN.—The joint Ophir, Sierra Nevada and Union Consolidated winze below the 3200 level has been sunk and timbered about 10 ft. The usual vein porphyry is taking the place of the bastard quartz which has heretofore been the predominant material at the bottom of the winze. The winze has but about 8 ft to go to reach the 3300 level. It will then be sunk about 10 ft further for a sump, when a station will be opened and a drift started west toward the mineral-bearing quartz found farther to the west on the levels above.

HALE AND NORCROSS.—The large double-track drift running north from the 2800 station is making about 45 ft per week. It is skirting the east side of the ore vein and on the west side occasionally cuts into the edge of what appears to be a strong body of quartz. The drift is being substantially timbered as it progresses and a drain is put in and covered as the work advances. The drift will be pushed forward to the Savage south line as soon as possible. Last week they shipped to the Eureka mill 383 tons of ore and received from it $7,744 47 (par value) in bullion.

BEST AND BELCHER.—The west drift on the 2500 level is out about 585 ft and is at present in a hard rib of vein porphyry. The drift has yet about 70 ft to go to get under the point where quartz and a good prospect were found above. The north drift from the 825 station of the Bonner shaft is out about 350 ft and is in vein porphyry with some seams of clay and stringers of quartz. The drift will open for cross-cutting a large area of ground hitherto unexplored.

ALTA AND BENTON.—The west drift on the 2150 level continues in quartz of a good quality, which carries some metal. The branch drift into the Benton ground is also in quartz of about the same kind. A second diamond drill-hole was last week started from the face of the east drift. This is a 2-inch hole, and will materially hasten the draining out of the ground lying to the east, and in which a large body of quartz, giving good assays, is known to exist.

CHOLLAR.—West cross-cut No. 1 was advanced 208 ft, most of the way through quartz, when the west wall was reached and its bearings taken. The ground was dry the whole distance. No. 2 cross-cut has now been started west from the main south lateral drift at a point 100 ft south of No. 1.

SIERRA NEVADA.—Are still repairing the drift on the 2300 level through which passes the compressed air pipe.

UTAH.—The material encountered in the southeast drift on the 1950 level has become quite hard. There is no water to interfere, the drift is cool and the workmen are able to make rapid progress. Some clay streaks are running in the direction of the drift, while seams of clay cut across it at short intervals.

ANDES.—A cross-cut is being run from the bottom of the winze. It is in soft white quartz that promises to carry ore. The north drift is in quartz that gives low assays. About the usual quantity of low-grade ore is being obtained.

ALPHA.—The north drift on the 500 level is making about 25 ft per week. The face of the drift is in quartz giving low assays.

BELCHER.—The usual quantity and quality of ore is being taken out on the old upper levels and sent to the mills on the Carson river. A considerable amount of prospecting work is being done.

CROWN POINT.—All work is going on about as usual. Sufficient low-grade ore is being extracted to keep the river mills in full and constant operation.

SCORPION.—The usual progress is being made in the north drift on the 500 level, and the material remains about the same as heretofore.

YELLOW JACKET.—The usual quantity and quality of ore is being extracted and a considerable amount of prospecting work is being done.

CON. VIRGINIA AND CALIFORNIA.—Are clearing up on the 2900 level preparatory to a resumption of operations at that point.

Belmont District.

A GOOD JOB.—Belmont *Courier*, Aug. 30: Some days since one of the cam shafts of the Monitor Belmont mill was accidentally broken in two. This shaft weighs about 3,000 pounds, and it was thought that the company would be obliged to send to San Francisco for a new one. James Coleman, the blacksmith at the mill, thought differently, however, and proposed to repair the broken cam shaft at the shop and make it as good as new. Many thought that this was impossible, for the reason that Mr. Coleman did not have the proper tools to accomplish the feat. At any rate, it was agreed that he should try his hand, and with the aid of the common blacksmith's forge, single bellows and tools he uses in the company's shop he succeeded in joining the two pieces, and the cam shaft is now, as Mr. Coleman said it would be, as good as new. This shows what a dexterous workman and first-class blacksmith can accomplish in an emergency of this kind. Stephen C. Rhonnan, who has returned from a prospecting tour through the southern country, showed us on Wednesday several rich specimens of gold quartz which were taken from claims situated about 8 miles west of Gold Mountain. He also brought in two nuggets, one of which is worth at least $30. They were found about 10 miles west of Gold Mountain. He says that it is almost impossible to work the gold claims in that section, on account of the rush of the waters.

Cherry Creek District.

RICH ORE.—White Pine *News*, Aug. 28: Al. Barrick, F. W. Griswold and George Taylor took out ore valued at $300 in one day last week in the upper workings of the Ticup mine; and yet Cherry Creek mines find no favor with men of capital. The time will come, sooner or later, when the two mineral belts that form a semi-circle above our town will be worked by aggregated capital, giving employment to thousands of men and pour a stream of the precious metal into the markets of the world. But before this occurs our leading mines must pass into the hands of men whose ambition will rise above the swindling tactics of those who now hold control. When our mines are worked to the sole end of making money for their owners, instead of defrauding the community, Cherry Creek will show that her mines bave true merit, and the capitalist who will be so fortunate as to invest in them will reap a rich reward.

Esmeralda District.

TWO AURORA MINES.—Eureka *Sentinel*, Aug. 29: The Humboldt mine is now working 20 men. Ore is being taken out as the development progresses On the Silver Lining 14 men are at work, running drifts north and south from the shaft. They take out about 10 tons a day. These mines now supply enough ore to keep the mill running nearly all the time, and there is not a question that when capital can be secured to open them extensively they will rank among the richest mines in the State.

Galena District.

INTEREST REVIVING.—Battle Mountain *Messenger*, Aug. 28: In 1867, before the snorting of the iron horse astonished the Indians and alarmed the coyotes in the valley of the Humboldt, Robert McBeth, the first Sheriff of this county, and George W. Fox left Unionville with an Indian guide, known to the whites as Shake-Hands-John, on a prospecting tour. They discovered Battle Mountain mining district, and located the Little Giant mine, which, for a while, was one of the richest in Central Nevada. Subsequently they found rich galena mines in the new district, in the vicinity of which McBeth located the town of Galena. The mines were very productive for a while, but when the ore bodies found near the surface were worked out, the district was partially abandoned, though many new and promising prospects were discovered. By act of the Legislature of 1873, the district, which up to that time belonged to Humboldt, was ceded to Lander county, of which it now comprises a part. Several of the original settlers still reside in Galena, and with J. A. Blossom and other Battle Mountain men have clung to their mining interests, believing that sooner or later they will reap the reward of perseverance and patience. The mine owners are now working with renewed energy and with very encouraging prospects. B. F. Wilson is preparing to start the White & Shiloh mill on ore from the Trinity mine. J. A. Blossom has put a force of men on the Temby mine extracting ore. Andy Melander bas men at work on the South Buena Vista extracting ore, which he ships to Salt Lake for reduction, and H. Driscoll has a large body of high-grade ore in the Honora mine, a chunk of which, weighing 120 pounds and assaying high in silver, is on exhibition at Lemaire's store in Battle Mountain. All that is required to make the camp prosperous is suitable reduction works, as there seems to be plenty of smelting and milling ores in sight.

Jefferson District.

LEACHING.—Belmont *Courier*, Aug. 25: Hon. George Ernst and Charles Kanrohat have been for the past few days, employed in leaching ore extracted from Mr. Kanrohat's mine at Jefferson, and we learn that these gentleman are meeting with success.

Mount Cory District.

DULL.—Walker Lake *Bulletin*, Aug. 30: Business is at a standstill, and there are more men here now than can make a living. Prospecting is vigorously pushed in the surrounding mountains, with a flattering outlook. Everything around the mine is running as smoothly and satisfactorily as usual, with a full force of men. Lew Stoner still continues to work his claim with all vigor and hopes of the future. The prospects are encouraging and promise soon to uncover a body of rich ore. Success, Lew.

Ophir Canyon District.

GOOD PROSPECTS.—Belmont *Courier*, Aug. 25: From Angus McArthur, who recently returned from the Toiyabe mountains, we learn that the mining propects at Ophir canyon and other districts are good. Mr. McArthur, like many other practical mining men, believes that rich mines exist in that portion of Nye county, and that all that is lacking there is capital to work the properties in a systematic manner.

Patterson District.

PROMISING.—White Pine *News*, Aug. 28: P. Peterson has returned from Patterson district. He speaks well of the place, and thinks when works are put up there, the district will prove rich and profitable.

Sacramento District.

THE HUMBOLDT QUEEN. —*Silver State*, Aug. 28: An important strike has been made in the Humboldt Queen mine, near Rye Patch. Reports from reliable sources are to the effect that a large body of very rich ore has been found in the mine at a depth of 125 ft from the surface. The strike is said to be the most important ever made in Sacramento district. The extent of the ore body is not yet known.

Tuscarora District.

BELLE ISLE.—*Times Review*, Aug. 30: North drift from joint line cross-cut, 150 ft level, has been extended 11 ft; total length 19 ft. The vein continues to carry high-grade ore, in width between one and two feet. Fair progress has been made in the line upraise from the 250-ft level. No material change to note.

NAVAJO.—The main drift has attained a total length of 270 ft south from the Belle Isle line. On the 150-ft level, the south drift from the line cross-cut has been advanced 7 ft. The vein continues between 4 and 5 ft wide. North drift from No. 2 cross-cut shows a better width of ore and has been extended 8 ft, total length 125 ft. No. 3 winze in south drift from No. 2 cross-cut has been sunk to date, 16 ft. The ore streak keeps its width and the last few feet shows considerable free gold. Fair progress has been made at all other points, showing no change worthy of note. The usual grade and quantity of ore has been sent to the mill.

White Pine District.

STAFFORD.—Cor. White Pine *News*, Aug. 28: Since the return of Mr. E. N. Robinson from the East, things have begun to enliven to quite an extent. He immediately placed a force of men upon the Stafford mine, which is now increased to the number of eighteen. He also has two men at work in the Wheeler tunnel, at which place bad air is a serious detriment. The company's mill is undergoing repair, a number of men being employed upon it. At the Stafford mine, after passing through what had hitherto been considered a hanging wall, a body of ore was discovered, which assays well, and up to date shows every appearance of being quite a quantity. The mine is certainly looking very promising now. Messrs. Shearer & Jacobson encountered such bad air in their mine at a depth of only 19 ft as to keep a candle from burning. They have now remedied this by communication with their old works,

QUARTZ MINES. Nevada *Transcript*, Sept. 1: The Merrifield mine is looking first-class. It is now upon a solid footing. The management has increased the working force to about 50 men, and the 20-stamp mill is kept in operation during the daytime. As soon as an opening is completed (which will be in about two weeks) to give better ventilation, more men will be employed, and the mill will run night and day. The mine is under the sole management of D. T. Hughes, one of the best miners on the coast. The mine of Balbridge and Kagan, on the Covoteville bedrock, continues to look well. Their first crushing paid them $80 per ton, and the rock they are now taking out looks equally as well as the first lot. They are down about 40 feet, and are using a hurdy wheel with a double-action Douglass pump, which keeps the mine free from water. The ledge is about four inches thick, and increasing as they go down. The Wilson Mining Company have taken out a crushing of rock, and the result was far beyond their expectations. The test was made on rock from near the surface. If the thousands of tons of rock in this mine would pay half as much as the test rock did, the property will be equal in value to any in this section. The Murchie mill is now being run on rock taken out of the Hussey mine at Willow valley. The rock looks fine. A good crushing of ore has been taken out of one of the Murchie's many ledges, and will be milled in a few days. It has a bright and lively appearance, and will undoubtedly make a good showing. Work was resumed yesterday on the Niagara claim on Fly creek. A 12-foot overshot wheel is being put in, when the shaft will be sunk as deep as possible before the running of any levels is commenced. There is considerable activity in the Willow valley district, and all the claims thus far prospected present a good appearance. Robinson & Co., who are opening the Blum & Curry ledge, a few days ago struck, at a depth of 43 feet, what appears to be a very rich deposit of ore, although, owing to a scarcity of water with which to keep their pump going at night, they are not making very good headway in prospecting the find. Some years ago a pocket that yielded $10,000 was found in the same locality.

ARIZONA.

NACOSARI. Tombstone *Epitaph*, Aug. 28: The latest news from Nacosari is that the new Swansea roaster of the New Jersey company is completed and in working order, and wagons are running over the new road to the mine. Work will be commenced on the San Pedro at once, which is four miles up the canyon from Nacosari camp. Times are lively and everybody feels encouraged.

RICH STRIKE IN THE TWEED MINES.—Florence *Enterprise*, Aug. 28: We learn from Mr. G. N. Finch, who came down from Dudleyville this week, that a very rich strike has been made in the Tweed, or San Carlos group. The strike was made at a point where one was least expected. The company was having a tunnel driven into a hill above a spring with a view to striking the head of the latter and increasing the volume of water. When in a considerable distance the tunnel entered a body of native copper. When Mr. Finch, was at the mine, Saturday, the tunnel penetrated this ore body a distance of six ft and was still all in ore. Mr. Finch went into the tunnel and saw the ore for himself so he knows it is there. The sides, floor, top and breast of the tunnel are a solid mass of ore, consequently it is not known how large the body is. We have a specimen of the rock, and it will go at least 70 per cent in copper, and we think it will assay well in silver. This strike insures the success of the San Carlos group.

LIVELY.—*Epitaph*, Aug. 29: Silver King is livelier now than it has been for years. There is not an idle man in the camp, and business is booming. One hundred and fifty men are employed in the Silver King mine alone. A report to the effect that the King company have leased the Hastings mill is current here, and if true the life and business in that section of the country will be greatly increased.

COLORADO.

THE MINES AT LAWSON. Colorado *Miner*, Aug. 28: Messrs. O'Brien & Co. shipped 9 tons of ore from their lease on the White lode, the first class of which ran 240 ounces, and second class 110 ounces. The boys are still hammering away, and have a fine streak, from 5 to 14 inches wide, which is pay ore. They have worked this lease for 20 odd months, and have made more than $3 per day to the man. Messrs. Longacre & Gates, on the Free America Extension lode, have a very fine streak of ore. It is a new strike, they having encountered it while drifting on the lode. They have drifted 40 ft on the streak, and it averages 8 inches in width. Bridenstein & Co. are running a cross-cut from the second level of the Free America Extension. They are now in 41 ft and will soon be in pay, as ore bodies are known to exist ahead of them. Potter Bros. & Co. are taking some fine ore from the ninth level of the Boulder Nest lode. They will run 10 tons this week. Their last mill-run gave returns of first class, 263 ounces and second class, 81 ounces. Irvin, Renwick & Co. are sinking from the Moore level on the Syster streak, and are doing well. The ore in this streak ran 200 ounces silver. The boys think they have a bonanza, and are running three 8-hour shifts. Messrs. Caruthers & Keaggy are still sinking on their new discovery, which runs alongside the Young America lode. They are now down 20 ft, and have had one mill-run that went first class 802 ounces silver per ton. A. Stevens has the Young America lode leased and bonded, and is shipping ore regularly.

THE BALTIMORE PROPERTY.—Messrs. Vivian & Co., leasing on the fourth level of the Baltimore lode, are drifting west, and have a fine streak of high-grade ore, Pope & Co., on the fifth level, west, have a good body of ore. The Italians on the third level have fine ore and are taking out good pay. They are drifting and raising. In the fourth level, east, the lessees have good ore, and are raising and drifting. In the sixth level, west, Messrs. Custer & Co. have the finest body of ore in the mine. Their streak averages from three to eight inches in width, and the value of the four classes averages in mill runs about 300 ounces silver per ton. The main shaft of the Baltimore lode is being sunk, and is now down about 315 feet from tunnel level. There is some mineral in the bottom of the shaft. The output of the Baltimore property for this month will be about $10,000, and development work is being actively pushed in all parts of the mine, to increase the yield.

IDAHO.

CLEAN UP. Idaho *World*: A clean-up was made about a week ago at the Golconda mill. Seventy tons were put through. Mr. Monroe, who came down yesterday, says the gold contains some iron, worn from the shoes and dies, and will be sent to a refinery at Omaha. As an assay has not been made, it is not known exactly how much the ore milled, but it is estimated at $40 per ton. The 5-stamp mill crushes 10 tons of ore in 24 hours.

CENTERVILLE. Idaho *World*, Aug. 25: Joe Jackson was over this week from Centerville. He says James McCurdy and Hugo Bayhouse have sunk a shaft to the depth of 20 feet on the footwall of the Poorman ledge, a short distance this side of Henry creek, and owned by Bayhouse. They will soon run a drift to the ledge. The ore at the surface gave very encouraging prospects. Charley Miller recently discovered a ledge, 4 or 6 inches thick, about a quarter of a mile this side of the south fork of Henry creek. The ledge crosses the Basin stage road. Some of the rock prospects very well. Miller thinks he has struck the ledge that fed the placers on Henry creek. Lamberton, Morrell & Small are still sinking on their prospect in Lewis' gulch. They have struck several small, rich seams. The ledge seems to be divided. By sinking they expect to soon get down to where the seams come together and form a solid ledge.

SNAKE RIVER PLACERS. Shoshone *Journal*, Aug. 25: The Long placer claim, about one mile west of Starrh's ferry, on the Snake river, is now being worked successfully, and is averaging about $10 a day, with a simple horse-power for pumping the water out of the river. He has only a very small burlap machine, half size, yet with a meager supply of water--perhaps less than half its capacity--the machine saves $10 a day in gold dust. The crude experiment is another proof of the value and richness of our Idaho placers.

THE DAVITT.--Challis *Messenger*, Aug. 26: The owners of the Davitt mine are Richard Fitzgerald, Peter Hughes, Joe Soucy and Jack Kirk. The strike of the Davitt is east, and the dip is very small, being nearly vertical. The pay vein, so far as opened, is not very large, running from a few inches up to a little over a foot; but the marks, or ore signs, are very strong. Vein matter is much larger, and it is liable to turn to a very strong and rich mine. The ore is superior to any other camp in the mountains we have seen, where galena accompanies it in the least. Galena, silver, iron and copper indications are very strong in this rock, and some looks like gold rock prevails, although little is found yet. The Ibex is but a part of the whole vein occupied by the Davitt Ibex, and, we believe, another location. The general course is very direct, and great similarity prevails as to appearances, with this slight exception: that the Ibex is lower in altitude, and even more stupendous in color and form of base ore and vein surroundings. There are two tunnels, and a shaft leading from the top nearly to the lower one; tunnels about 40 feet apart, both run in on the vein perhaps a hundred feet in all. All work is on the vein, but has been done for exploration only. Still, there is a good pile of ore on the dumps. No considerable shipments have been made. The owners, Richard Fitzgerald and Peter Hughes, intend shipping when the packers get around.

AT CLAYTON there is a constant delivery of immense loads of ore both from teams and packs, and a smelter running about as smoothly as oil runs from a can. Twenty or thirty men were wanted, badly. Every man at work in a mining camp is a reliable omen of good. The smelter has been so overhauled as to permit the delivery of coal at a higher point, for the convenience of the whole works, than it used to be. Fine bins of ore were awaiting reduction. There were 25 bars of bullion being put out on each shift, on an average, or 50 during each 24 hours, at this time. Weight of bars 100 pounds each, the bullion running about $600 per ton. Considerable trade is centering at this point again, but the strong marks of waste and haste attendant upon a former mining excitement are broadcast. This will all be changed now. Men who understand their business are presiding.

THE EXCELSIOR was the only point that seemed to be carrying much interest or excitement as we passed on our way home. Here shots were crashing among the rocks and ore of the mine, and teams and pack trains were in such abundance at the ore house, at the foot of the delivery incline, that one could hardly get through. The Excelsior was working 26 men, but, like most other points, was increasing. The mine is opened 170 ft in length and 80 ft in depth in connection with the main, lower or present workings. The ore body runs from 2 to 16 ft in width, making an average of about 7 ft. Average returns from all ore shipped to the Clayton smelter up to date, this season, 103 ounces of silver and 34 per cent lead. The present working tunnel is 145 ft below the upper tunnel and 350 feet down from the topmost workings on the mine. All the ore is being reduced at the Clayton smelter which is taken out, leaving only about 100 tons reserve in the ore house against a possible misfortune, by any chance, in the mine. The daily output was 12 to 13 tons per day (since considerably increased), but for lack of teams would be putting out more.

PLACER.—*World*, Aug. 26: K. P. Plowman made a clean-up last Saturday in his placer claim at the back end of East hill. The amalgam weighed about 175 or 180 pounds, and runs about $110 or $111 per pound. Mr. Plowman will finish retorting in a day or two, when the exact figures of the clean-up will be known. The lowest estimate is $19,250. Work was commenced on the 22d of May. The claim has turned out well.

PRITCHARD CREEK.--*Inter-Mountain*, Aug. 30: From parties lately returned from Murrayville we learn that affairs in the Coeur d'Alene country seem to have settled down to actual business, and the excitement and rush and turmoil incident to the stampede have entirely subsided. The suspension of operations on the big ditch caused the throwing out of employment of between 250 and 300 men, which took some of the boom element out of the camp. The ditch was to have been 10 miles long, and when completed would have furnished 3,000 inches of water for the working of the old channel of Pritchard creek, lying about a mile and a quarter north of Murrayville, and 800 to 600 feet above the present channel. This old channel is claimed to show the richest prospects that have ever been discovered; but as the dirt has to be carried from a mile to a mile and a half before water can be reached with which to wash it, the investigation is attended with some difficulty. Below this old channel, wherever there is the trace of a little stream running down into the new channel, very rich pockets have been found, which is sufficient authority to the prospector for the assumption of the riches to be found above. In the present workings of the new channel the great difficulty experienced is the abundance of water and the roughness of the bedrock, the water washing the gold into the crevices as fast as it is uncovered or disturbed. The stories of large nuggets are still rife, and well authenticated reports come of a nugget weighing 52 ounces, while our informant exhibited the outline drawing of a nugget weighing about 30 ounces. The claims are undoubtedly rich in spots, but the impossibility of at present reaching any considerable area of bedrock precludes an intelligent estimate of the merits of the gulch. The claim owners are confident that they have within their grasp the much sought for fortune, and that while it is a hard country in which to mine, it is nevertheless rich enough to warrant the outlay of considerable time and money. For the man who is dependent upon wages for his daily bread and butter it is a good camp to stay away from, the ruling compensation of $3 per day not being allurement enough to stand off the hardships and privations to be encountered.

MONTANA.

THE MISSOULA GOLD FIELDS.—Helena *Independent*, Aug. 28: R. J. Cudner, of Missoula, who was in town yesterday, reports that the gold excitement continues unabated. It is not exactly an excitement, either, but more of a quiet business move in which a large portion of the business men of the town have interested themselves. Some 200 or 300 claims of 20 acres each have been taken up within 3 miles of town, and in some cases wheat fields even have been staked off. Some of the owners are very enthusiastic in regard to the future of the discovery. The pay on the surface seems to be good, and from this it is argued that when bed-rock (supposed to be some 20 ft deep) is reached, the amount of gold taken out will be great. One enthusiastic individual who owns only 5 acres has refused to take (even if anybody should be wild enough to offer it) $50,000 for his claim. He expects on reaching bed-rock to find a layer of nuggets 3 inches thick, he says. Some of the old residents of Missoula, however, refuse to place any faith in the discovery. They say that all the gold that is there is on the surface along the banks of Missoula river and at the mouth of Deer creek, and that it is merely a few scattering grains of gold that have been scooped by the ice while moving out of Gold creek and deposited here a grain or two at a time during hundreds or thousands of spring thaws. It is a fact that so far no gold has been found excepting on the river bank, but how tenable the theory above recited may be remains to be seen. In the mean time the claim owners intend to go right on with their work, as generally they are satisfied that they have fortunes almost in hand.

FIRST ORE SHIPMENT FROM THE ISABEL.—T. G. Merrill yesterday shipped to Newark, N. J., a carload of silver ore (smelting) from the Isabel mine, situated about 7 miles west of Helena, on the divide between Ten Mile and Greenhorn. The ore averages about $100 per ton, and comes (with scarcely any selecting) from a vein 3 ft thick. The Isabel is one of the mines owned and being developed by the Quartette Company, of which Mr. Merrill is manager. It promises to be a very valuable property.

LONGEST TRAMWAY IN THE WORLD.—The tramway to be constructed for the Helena Mining and Reduction Company will be one of Huson's patent endless-wire rope tramways. It will extend from the Comet mine to the bottom of the hill this side of the smelting works, a distance of 2½ miles. It will be the longest tramway in the world, and will cost $20,000. The construction will be under the personal supervision of Mr. Charles Huson, the inventor, and he expects to get it done inside of 60 days.

THE MOLLIE MCGREGOR.—Butte *Miner*, Aug. 29: About the 1st of last January, Messrs. J. R. Boyce and John H. Curtis bonded the Mollie McGregor lead, situated in the Boulder district, about thirty-five miles from Butte to a Connecticut company for the sum of $65,000. Since that time a hoisting works has been erected and machinery put in and everything done to put the property on a solid basis. Recently a body of ore assaying well was struck. This seems to have elated the parties having the mine under bond, and a short time since a letter was received from them making an offer of $30,000 cash down and $30,000 in six months for the mine. As the term of the bond has not yet expired, and the acceptance of their offer would involve a loss of $5,000, Messrs. Curtis & Co. have not yet given an answer to the proposition. The mine is said to be one of the best looking prospects in the Boulder district, and as it stands is worth $65,000 of anybody's money.

NEW MEXICO.

LEACHING.—Silver City *Enterprise*, Aug. 29: The new leaching process machinery which M. W. Bremen has been engaged in putting into his mill the past three weeks, is ready to make a test run, and will start up to-day. Mr. Bremen has between 7,000 and 8,000 tons of mill tails to treat by this process, and from which he will reap many thousands of dollars. A strike is reported to have been made in the Apache district, twelve miles southeast of Eureka, by McGee and Downy, two well-known prospectors, which is said to run from 68 to 226 ounces per ton. The vein is said to be from two to four feet in width. Work has been commenced, and a car shipment will be made immediately. Barney Tiernan has got down 365 feet on the King mine, at Eureka, but, as yet, has found no ore. He will continue exploration work to a depth of 500 feet, and if he encounters ore, such as was found on the surface of the claim, it will repay him for his work. Operations are being vigorously pushed on this property. Mr. Bonner, of Fleming, came into town on Wednesday, to procure ore sacks in which to put ore sufficient to make a carload shipment of the ore taken from his claim, two miles east of Fleming. He reports his property as looking well, and the ore improving in richness as depth is attained. On Monday next ore for another two car shipment from the Telegraph district will be brought into town by Mr. J. T. Mitchell, superintendent of the company's property. Regular shipments will hereafter be made from this camp of ore that will pay the company well, considering the expense and disadvantages which they have been obliged to contend against. Encouraging reports continue still to come in from Gold Gulch. More hard work is being done by the miners of this camp than is the case with any new camp in the territory. It is but a few months old, yet the work done since its discovery would lead one to think that the dumps are the result of years of work. Several car shipments will shortly be made by the mine owners, and the returns will be awaited with interest, as it is believed the average thus far assorted will run about $100 per ton. If this proves true, within a few months Gold gulch will be one of the liveliest mining camps in the territory.

OREGON.

NOTES. Jacksonville *Times*, Aug. 28: H. M. Hassett and A. T. Johnson have gone into Siskiyous on a prospecting trip. Dr. Inlow, of Ashland, struck some rich prospects the other day, getting about a dollar from half a bushel of dirt. He will prospect still further. Dan. Fisher, Robt. Dean and J. W. Ingram put a wing-dam in Rogue river this season, but we regret to learn that the enterprise has not proved a successful one. M. Volk, who is interested in the placer mines of Cow creek with Mr. Dunnell and others, was in Jacksonville Friday, accompanied by T. Ferguson. It is proposed to work these mines more extensively than ever next season.

UTAH.

PARK CITY NOTES.—*Record*, Aug. 28: It is reported that there has been a new strike on the Daly property. The Bon Homme Co. have just completed a whim for use on their shaft which is down in the neighborhood of 150 ft. Barry and Greggs' claim, the Talco, at the head of Deer valley is developed by a 50-ft tunnel and has quite a good showing, the ore taken therefrom carries 7 per cent copper and 7 ounces in silver per ton. There has been quite an excitement on Jubiter Hill made by three or four parties laying claim to the same piece of ground; the matter at present is at a standstill, one of the fighting men being in Salt Lake. A visit to the Sampson this week showed that that company was pushing work right along on that claim and the work being done there is of the most substantial sort. The new tunnel is in quite a distance and some very fine float ore has been found in it, when it is completed, it will cut the vein at a depth of 450 ft.

ALTA.—Salt Lake *Tribune*, Aug. 29: The mines of Alta lie around the heads of the creek on the sides of the hills in an amphitheater which might have been made by a glacier gouge. Henry Wagener is working the Moltke, which has a thin streak of very rich ore. James Wall & Co., are running a tunnel into the Peruvian and have good showing for a mine. Col. Sells is working the Skipper and the Sedan. He has a large body of low-grade iron ore. Captain Morrell is doing but little. The Morrell & Gardner Company wants to put up. Mines are not found or made to pay without the wherewithal. Lem Colbath's City Rock, striking straight through the divide at the head of the creek, has just sent down 5,000 sacks of ore. About 30 men are employed. In the Prince of Wales an important strike of good ore was lately made at a place, and at a depth entirely unexpected. It is high grade and two to three feet thick. The strike was made by the owners (Walker Bros.,) who lease most of the mine, but always have kept a few men at work on their own account. It is considered very important by those interested in the camp. Mr. Wallace is driving an adit tunnel under the old ore body in the Grizzly and Lavinia, which are owned by Capt. A. E. Goodrich of Chicago. Also raising from the tunnel about 400 feet in. The Evergreen, owned by Messrs. Pugsley, Folsom, Romney, and others, of Salt Lake, is taking out and shipping some ore. Mr. John W. Harker, of the Mackay and Revolution has leased the Equitable tunnel and is running a tunnel off from that under these mines. It will be some 400 ft below the old workings. There is said to be thousands of tons of ore in the old mine. Mr. Harker has purchased a mill site at the north of the canyon, and is negotiating for a wet process 10-stamp mill, with which he expects to earn dividends out of the Mackay and Revolution mines. The Montezuma Company, of Detroit, Michigan, is driving a tunnel 1,400 ft long to cut the Montezuma and Savage mines, 500 ft below the old workings. The Joab Lawrence is running for its mines by a branch off from the Illinois tunnel, through which it is expected to drain them so that they won't have to wait the better part of each season for the surface water to subside. The Emma Hill Tunnel and Mining Company, owned in Allegan, Michigan, is driving a tunnel to strike at great depth a group of claims. The tunnel is now 800 ft long.

IN THE NEW EMMA.—About two tons of 400-ounce ore was found on the 120-ft level from the shaft, and the level was being further prospected when the avalanche of last March dropped on the works out of the sky, as it were, killing the foreman and ten others. At the same time the shaft had been run down another hundred feet, and they were cutting out a station preparatory to opening a new level, 700 ft below the old Emma bonanza, but connected with it by a continuous thin sheet of rich ore. This shaft is 1,740 ft in from the mouth of Bay City tunnel.

REVIEW.—Salt Lake *Tribune*, Aug. 29: The week has been rather a dull one in mining circles. The low price of lead causes lethargy in a large number of what would, with fair prices for lead, be good producing properties. The receipts of bullion and ore in this city for the week ending August 27th, inclusive, were: Of bullion, $105,989.14; of ore, $12,840; of both, $118,829.14. For the week previous the receipts were $130,588.69 of bullion, and $9,300 of ore; total, $139,888.69. The Horn Silver product for the week ending August 27th, inclusive, was 18 cars of bullion, $54,000, which brings the total product of this mine for the year up to $1,612,000. The shipments of the Ontario for the week ending August 27th, inclusive, were 46 bars, of the value of $34,639.14; total product this year to date, $1,094,288.66,

CHICAGO **FRASER & CHALMERS.** ILLINOIS

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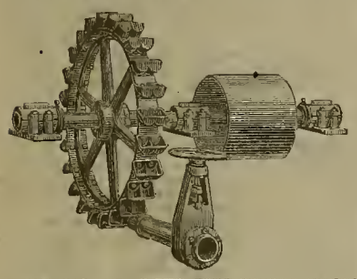

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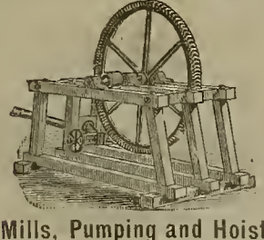

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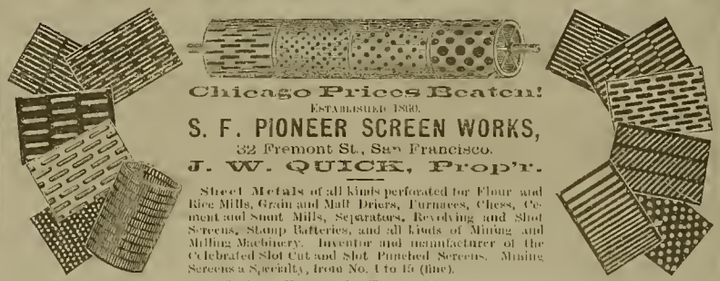

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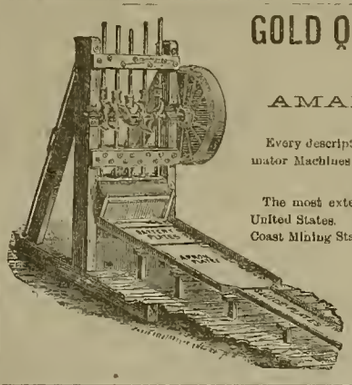

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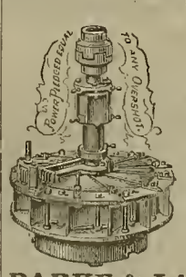

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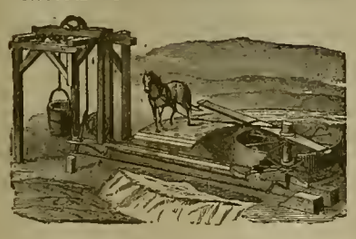

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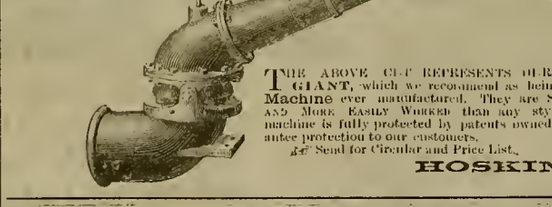

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Mining Share Market.

Mining stocks continue very dull, and what few fluctuations there are show a five-cent basis, very different from what used to be the case. Up on the Comstock they are delving away in hopes of striking something.

At the north end work is progressing favorably at all points where anything is being done. The deep winze below the 3200 level of the Mexican will be sunk and timbered nearly ten feet this week. This will leave about eight feet to go to reach the 3300 level. Below that level a sump about 10 feet deep will be sunk, and then a station will be opened from which to start a west cross-cut.

The Virginia *Enterprise* speaking of affairs there, says: The Chollar folks have driven west cross-cut No. 1 through to the west wall, the bearings of which have been taken, and west cross-cut No. 2, 100 feet further south, started. No. 1 cross-cut shows a great body of almost solid quartz. This quartz is of good grain and appearance and is found to be fertile, though where thus far explored the assays are quite low. As it is seen that this vast deposit of quartz in the Chollar and the Norcross, lying off to the west, is such as ore may live in, it is not unreasonable to expect that in some parts of it will be found bodies of paying ore. In tact, it is known that there is at one point, at least, on the 2,800 of the Hale & Norcross such a deposit of ore. The extent of this body of ore remains to be ascertained.

At Gold Hill the Yellow Jacket, Kentuck, Crown Point and other mines are taking out and sending to the mills about the usual amount of low-grade ore.

Bullion Shipments.

Paradise Valley, Aug. 29, $4,477; Silver City 29, $3,000; Banner, 29, $7,000; Horn Silver, 24, $6,000; Hanauer, 27. $3,550; Stormont, 27, $3,250; Horn Silver, 27, $6,000; Ontario, 27, $4,722; Horn Silver, 28, $6,000; Ontario, 28, $4.757; Hanauer, 29, $3,700; Horn Silver, 29, $12,000; Ontario, 29, $4,503; Hanauer, 30, $3,650; Crescent, 30, $2,750; Horn Silver, 30, $3,000; Ontario, 30, $6,291; Vienna, 29, $4,883; Horn Silver, 31, $12,000; Ontario 31, $4,194; Hanauer, 31, $1,850; Wood River, 31. $2,850.

During the week ending August 30th, 35 cars of bullion aggregating 887,499 pounds, and 24 cars of ore, aggregating 753,000 pounds, were shipped East from Salt Lake City.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department 10, San Francisco:

NORTHERN CALIFORNIA R. R. CO., Sept. 1. Capital stock, $320,000. Object, to build a railroad from Marysville, Yuba county, to Oroville, Butte county, a distance of 26½ miles. Directors—N. D. Rideout, A. J. Benney, Nicholas Luning, M. B. Langhorne and George Whittell.

EXCELSIOR DYNAMITE CO., Sept. 1. Capital stock, $1,500,000. Object, to manufacture a new explosive. Directors—J. P. Jones, Gold Hill; Fred. H. Jenssen, A. M. Starr, Charles H. Wells, J. A. Farnsworth, M. T. Dusenberry and E. W. Marston.

Sacramento Union Iron Works.

Among the first industrial establishments of importance in the history of Sacramento stands this successful foundry and machine shop. It remains almost alone among the permanent pioneer works of early days. Messrs. Root & Nielson, both practical mechanics in different departments, have long been successfully connected with the concern as proprietors, and the remarkably satisfactory work they have turned out is now doing good service in nearly every part of the country, from Idaho to Arizona, in cities, towns, mines and on farms. Having intimately known the senior member of the firm as a first-class master mechanic in Springfield, Mass., thirty years ago, we are pleased to note the worthy and well-earned success of himself and active partners.

PROGRESS IN SCIENCE.—The developments of physical science have received a wonderful impetus within the last ten years. Twenty odd years ago, according to the chief literature on opthalmology, we find very conflicting opinions entertained by many eminent physiologists regarding the pathology of the eye when accommodation was not understood nor the cardinal points of physiological dioptrics. Astigmatism of the eye is very often treated for amblyopia, amarosis, etc., while it is a mechanical defect, and can be corrected by simple or compound lenses correcting the errors of refraction. Many to this day don't comprehend the difference of refraction or accommodation. Old sight, or presbyopia, is ranked with a faulty formation, and the belief still exists in the minds of many that as a person grows older the eyes fatten. Having tested over 2,000 complicated cases of defective sight in the last three years, which I have a record of, I confidently solicit all who are troubled with painful forebodings of loss of sight and defective vision, inflammation of the eyes, to avail themselves of my professional services free of charge.

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Arnold G & S M Co	Arizona	2	50	Aug 1	Oct 1	Oct 28	A Judson	320 Sansome st
Alpha Con M Co	Nevada	18	50	July 16	Aug 21	Sept 10	W Willis	309 Montgomery st
Alaska M and M Co	Alaska	7	1.00	July 22	Aug 26	Sept 16	E F Stone	306 Pine st
Alta S M Co	Nevada	30	50	Aug 21	Sept 25	Oct 15	W H Watson	302 Montgomery st
Boracic Acid M Co	California	3	05	July 21	Aug 25	Sept 15	H C Droger	309 Montgomery st
Benton Con M Co	Nevada	13	25	July 22	Aug 26	Sept 15	W H Watson	302 Montgomery st
California M Co	Nevada	13	20	Aug 4	Sept 11	Oct 8	C P Gordon	309 Montgomery st
Caborca M Co	Mexico	9	05	July 18	Aug 22	Sept 22	H C Edgerly	328 Montgomery st
Con Anmdor M Co	California	7	50	July 21	Aug 21	Sept 10	F B Latham	408 California st
Chollar M Co	Nevada	14	50	July 23	Aug 26	Sept 15	C L McCoy	309 Montgomery st
Champion M Co	California	16	10	Aug 22	Sept 26	Oct 16	T Wetzel	522 Montgomery st
Con Imperial S M Co	Nevada	21	10	Sept 1	Oct 7	Oct 28	C L McCoy	309 Montgomery st
Excelsior W & M Co	California	7	50	Sept 2	Oct 7	Oct 28	W J Stewart	215 Sansome st
Eldtracht Gravel M Co	California	16	05	Aug 26	Sept 1	Oct 18	H Kmtz	209 Sansome st
Equitable Tunnel M Co	Utah	30	40	July 29	Sept 15	Oct 7	W A Van Bokkel n	419 California st
El Dorado Con M Co	Nevada	3	04	Aug 16	Sept 19	Oct 8	J H Sayre	330 Pine st
Enterprise M Co	California	1	15	July 1	Sept 13	Oct 4	W Van Bokke'en	419 California st
Golden Fleece G M Co	California	33	50.00	Aug 6	Sept 10	Sept 27	F Schernier	412 Sixth st
Martin White M Co	Nevada	18	25	July 25	Sept 4	Oct 2	J Scoville	309 Montgomery st
Morgan M Co	California	11	1.00	July 3	Aug 30	Sept 22	C S Neal	309 Montgomery st
New York Hill M Co	California	8	20	July 29	Sept 2	Sept 23	B Lightner	527 Clay st
Oleta M Co	California	1	10	July 26	Aug 30	Sept 20	T H Ganeard	9th and Market st
Potosi M Co	Nevada	16	50	July 29	Sept 2	Sept 23	C L McCoy	309 Montgomery st
Summers Con M Co	California	1	05	Aug 18	Sept 22	Oct 16	F B Laty	330 Pine st
Summit M Co	California	7	05	Aug 8	Sept 3	Sept 29	G W Sessions	309 Montgomery st
Santa Anita M Co	California	7	02	July 30	Sept 2	Sept 22	J M Buffington	306 California st
Utah S M Co	Nevada	50	50	Aug 18	Sept 22	Oct 11	C P Pratt	309 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Antonia M & M Co	California	J P Hopkins	309 California st	Special	Sept 15
Day S M Co	Nevada	E M Hall	327 Pine st	Annual	Sept 16
Grand Prize M Co	Nevada	E M Hall	327 Pine st	Annual	Sept 16
Mono M Co	California	G W Sessions	309 Montgomery st	Annual	Sept 18

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	May 15
Bodie Con M Co	California	G W Sessions	309 Montgomery st	50	June 5
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Aug 26
Idaho M Co	California			4.00	Apr 2
Jackson M Co	California	D C Bates	309 Montgomery st	10	Mar 16
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 21
Pacific Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Apr 28
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Mar 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Sept 5

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug. 14		WEEK ENDING Aug 21.		WEEK ENDING Aug. 28.		WEEK ENDING Sept. 5.	
Alpha	1.00	1.50	1.25	1.75	1.25	1.45	1.60	2.00
Alta	1.95	2.55	1.90	2.65	2.10	2.40	2.10	2.30
Andes	.25	.30	.25	.30	....	.25	.20	.25
Argenta	....	....	....	....	.15	.25	....	.15
Belcher	1.00	1.05	.85	.95	.85	.90	.30	.90
Belding	....	....	....	....	....	....	....	....
Best & Belcher	1.75	2.85	2.25	2.55	2.20	2.35	2.30	2.45
Bullion	.55	.70	.55	.60	....	.50	.50	.60
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	.50	.60	.65	.85	.70	.75	.60	.65
Bodie Con	1.75	2.00	1.95	2.15	1.90	1.95	1.05	1.95
Benton	.40	.50	.35	.50	.40	.75	.50	.65
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	....	.60	....	.60	....	.50	....	....
California	....	.10	.10	.15	....	.15	.10	.15
Challenge	....	.25	....	....	....	.15	.20	.25
Champion	....	....	....	....	....	....	....	....
Chollar	2.75	4 10	1.80	3.50	1.80	2.60	3.60	3.00
Confidence	....	1.00	....	1.00	....	....	....	1.00
Con. Imperial	....	.05	....	....	....	....	....	.05
Con. Virginia	.25	.30	.25	.30	.35	.40	.25	.35
Con. Pacific	.50	.55	....	.55	....	.55	.55	.60
Crown Point	1.35	1.45	1.40	1.45	1.30	1.35	1.30	1.40
Day	....	....	....	....	....	....	....	....
Eureka Con	....	2.50	....	....	....	....	....	2.50
Eureka Tunnel	....	....	....	.50	.40	.55	....	.55
Exchequer	.40	.50	.35	.45	.30	.40	.40	.45
Grand Prize	.60	.75	.50	.60	....	.50	.30	.50
Gould & Curry	2.20	2.50	1.90	2.30	1.90	2.05	2.00	2.40
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	2.40	2.95	2.40	3.00	2.75	3.25	3.10	3.60
Holmes	....	2.00	....	....	2.50	3.00	....	....
Independence	....	.25	....	.30	....	.25	....	....
Julia	....	....	....	....	....	....	....	....
Justice	....	.20	....	.30	.15	.25	.15	.20
Martin White	....	....	....	....	....	....	....	.30
Mono	.60	1.75	.70	.90	.60	.90	.60	.65
Mexican	2.00	2.35	1.50	2.05	1.45	1.60	1.50	1 70
Mt. Diablo	....	....	....	2.00	....	....	....	2.25
Northern Belle	....	....	....	....	....	....	....	....
Navajo	2.75	4.00	4.00	4.20	4.00	4.15	3.50	4.15
North Belle Isle	....	....	.30	.35	....	....	....	....
Occidental	1.10	1.15	....	1.25	....	1.25	....	1.10
Ophir	1.35	1.50	1.05	1.35	1.05	1.20	1.10	1.25
Overman	.15	.25	.15	.20	.15	.20	.15	.80
Potosi	1.45	2.15	1.00	1.85	.95	1.05	1.05	1.75
Pinal Con	....	....	....	....	....	....	....	....
Savage	.90	1.15	.90	1.05	.95	1.25	1.25	1.70
Seg. Belcher	1.75	2.00	....	2.00	....	....	....	....
Sierra Nevada	2.20	2.50	1.35	2.10	1.30	1.50	1.45	1.65
Silver Hill	....	....	....	....	....	....	....	....
Silver King	....	4.50	....	....	4.25	4.50	....	4.50
Scorpion	.30	.40	.25	.30	....	.25	.25	.30
Syndicate	....	.40	.40	.45	....	.45	.45	.55
Tioga	....	....	....	....	....	....	....	.05
Union Con	1.70	2 00	1.05	1.50	1.10	1.20	1.15	1.30
Utah	1.40	1.65	.75	1.25	....	.95	1.00	1.15
Yellow Jacket	2.00	2.15	1.95	2.60	1.75	1.90	1.70	1.90
....	....	....	....	....	....	....	....	....

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Sept. 4, 1884

ANTIMONY Per pound		@ —
Hallet's	14	@ —
Cookson's	15	@ —
BORAX—Refined	8½	@ —
IRON—Glengarnock ton	23 50	@ —
Eglinton, ton	22 50	@ —
American Soft, ton	27 00	@ —
Oregon Pig, ton	—	@ —
Clipper Gap, Nos. 1 to 4	30 00	@ 32 50
Clay Lane White	22 50	@ —
Shotts, No. 1	26 00	@ —
Refined Bar	3½	@ 3
Boiler, 1 to 4	5 00	@ 5 50
Plate, 5 to 10	4½	@ 4½
Nail Rod	7½	@ —
Norway, according to thickness	6½	@ 7½
STEEL—English, lb	16	@ 25
Black Diamond, ordinary sizes	14	@ —
Drill	15	@ —
Machinery	12	@ 14
COPPER—Ingot	15	@ 16
Braziers' sizes	26	@ 28
Fire-box sheets	28	@ 37
Bolt	23	@ 25
Old	12½	@ 15
Bar	—	@ —
Cement, 100 fine	12	@ —
Copper in New York, Sept. 3	13⅜	@ 13⅜
LEAD—Pig	3½	@ 4
Bar	5½	@ —
Pipe	7	@ —
Sheet	8	@ —
Shot, discount 10% on 500 bags: Drop, ₱ bag	2 00	@ —
Buck, ₱ bag	2 20	@ —
Chilled, do	2 40	@ —
TIN PLATES—Charcoal	7 00	@ 7 25
Coke	5 75	@ 6 75
Pig	19 00	@ 20 00
Banca tin	22	@ 23
I. C. Charcoal Roofing, 14x20	6 25	@ 6 50
ZINC—By the cask	19	@ —
Sheet, 7x3·ft, 7 to 10 lb, less the cask	9	@ 10
QUICKSILVER—By the flask	30 00	@ —
Flasks, new	1 05	@ —
Flasks, old	85	@ —

THE Pacific Nail Works, Oakland, is compelled to shut down a few days, owing to an accident to the engine.

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Sept. 4. AFTERNOON SESSION.

850 Alta 1.95@2.00 120 Alpha 1.55@1.60
30 Alpha 1.85 1300 Alta 2.10@2.15
50 B. & Belcher 2.40@2.50 70 B. & Belcher 2.45@2.50
50 Belcher 90c 20 Belcher 90c
250 Benton 55c 1150 Benton Con 40c
200 Chollar 2.65 400 Chollar 2.65@2.70
100 Crown Point 1.25 1050 Con. Virginia 30c@30c
100 Gould & Curry 2.20 380 Gould & Curry 2.25
100 Grand Prize 45c 500 Hale & Nor 3.35
1050 Hale & Nor 3.20@3.25 200 Justice 15c
250 Mono 80c@85c 320 Mexican 1.50@1.55
650 Navajo 3.65 100 Mono 70c
100 Ophir 3.60@3.65 150 Navajo 3.60@3.65
20 Occidental 1.10 350 Ophir 1.15
200 Overman 15c 100 Potosi 1.65
200 Potosi 1.65 385 Sierra Nevada 1.45@1.50
600 Savage 1.30@1.35 1150 Savage 1.35@1.40
150 Sierra Nevada 1.40@1.45 50 Utah 90c
200 Union 1.15

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

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Orders for Mining and Scientific Books in general will be supplied through this office at publishers' rates.

LUBRICATING OILS

May we suggest as the result of a long experience in the manufacture and use of Oil, the following facts:

1. Generally, twice as much Lubricating Oil is used as is necessary.

2. The Oils generally used in the West, cost too much money.

There is no use of paying the high prices necessarily demanded for Lard, Tallow, Castor, China-nut, and other animal and vegetable Oils sold for Lubricating purposes.

WE GUARANTEE TO SAVE FROM 25 TO 50 PER CENT.

☞ Please write us briefly for what purpose the Oil is used, and we will return GRATIS enough Oil to prove what we say.

Our Oil has now been adopted as

Cheaper, More Economical and More Serviceable than Any Other Oil

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ADDRESS:

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Manager Lubricating Department.
123 CALIFORNIA ST., SAN FRANCISCO, CAL.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & CO.'S SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.]

FOR WEEK ENDING AUGUST 26, 1884.

304,062.—WHIP SOCKET, OIL CAN AND WRENCH—C. L. Bard, San Buenaventura, Cal.

304,163.—FLAMBEAU—Wm. M. Bristol, Los Angeles.

304,068.—DEVICE FOR HOLDING, CUTTING AND STAMPING PAPER—Albert Brown, Mendocino.

304,277.—LOCK AND LATCH—E. Nyswonger, Hanford.

304,029.—FEED WATER HEATER—Thos. J. Pyne, S. F.

304,136.—WINDMILL—Saunders & Bentley, San Jose.

304,245.—RULER FOR MEASURING, ETC.—H. E. Thomas, S. F.

304,054.—CAR TRUCK—Wm. Whiley, Oakland.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

INDEX.—Max Levy, S. F. No. 303,440. Dated August 12, 1884. This is an improved index which is principally useful in connection with ledgers used in book-keeping to facilitate the work of posting. It consists of shelf covers of innumerable length, having narrow sheets of paper bound into them, so as to form an independent series of these fine inner sets, having lines parallel with the back of the book. These sets are bound into the cover, so as to extend from the back to the front, lying side by side, so as to fill the space between the covers from end to end, and the leaves of each set may be lifted independently. Index letters are printed upon the lower front edges of the sheets, which are so cut as to expose them, and by the use of a stylus the leaves may be readily turned back to expose the ones below with the names inscribed thereon.

MOP WRINGER. Wm. F. Mills, Oakland. No. 303,742. Dated August 19, 1884. This is a self-wringing mop and brush attachment, and the invention consists in a means by which the mop can be wrung without handling it. The object is to provide a house implement which is adapted to wring the mop conveniently without taking it in the hands.

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NEW AND SECOND HAND BOILERS, ENGINES, AND MACHINERY.

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Centrifugal Pumps.
MINING PUMPS.

BLOWERS
— AND —
Exhaust Fans.

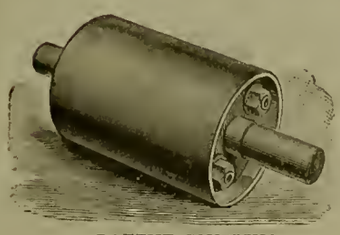
Leather and Rubber
BELTING.

UPRIGHT ENGINE AND BOILER.

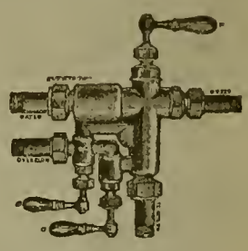
MACHINISTS' TOOLS
— COMPRISING —
LATHES,
DRILL PRESSES,
PLANERS, Etc.

WOODWORKING
MACHINERY
— COMPRISING —
Band-Saws,
Stickers,
Planers,
Shapers,
Etc., Etc.

HANGER.



PATENT COUPLING.



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This machine has been thoroughly tested for the past two years under a great variety of conditions giving most extraordinary results, far in advance of anything ever before realized.

A recent competitive test made with the Frue at the Carlisle mine, in New Mexico, showed an advantage of 30 per cent in favor of the Duncan. The amount saved over the Frue being sufficient to pay the entire cost of the machines nearly every month of the year. The following is an enumeration of its many advantages over all other similar machines:

1. Its cost is not more than half that of any other of equal capacity, and the weight is nearly 1,000 pounds less, thus greatly reducing the cost of transportation.
2. The expense of setting up in running order is not more than one-third that of the Frue, or any other belt machine, much less grading and timber work being necessary.
3. The expenditure for repair is not more than one-fifth that of any belt machine, and they will last fully three times as long, working under the same conditions.
4. Not more than one-half the space is required—a point of great importance where a considerable number are used.
5. No special skill and very little care is necessary to operate it.
6. No more water is required than is furnished by the batteries.
7. It saves all the amalgam, gold or silver, that escapes the batteries, pans or settlers—AN INVALUABLE FEATURE, and claimed by no other, making the machine worth more than it costs for this purpose alone.
8. A much coaser grade of ore can be handled successfully than by any other machine—a great advantage in many instances where fine crushing is not necessary to eliminate the mineral.
9. It has no small and delicate mechanism, requiring nice adjustment and the closest attention—an insuperable objection to all belt and other forms of machines, making them wholly unfit for the rough service of a quartz mill.
10. Great simplicity of construction and small number of wearing parts. The whole machine is comprised in 17 pieces, only 3 of which are subject to any especial wear, and these can be replaced at a nominal cost. The Frue has 113 pieces, and some similar machines many more, making a complication of parts that involves constant repair and great expense in this way, as well as in loss of time.

We are aware that the most sweeping and pretentious claims are made for nearly every concentrator in the market, but it is a well-known fact that the results of their operation have not in any instance made good these claims. The advantages here set forth for the Duncan, as well as the statements made, we are prepared to substantiate by actual working results. **Price, $350. Weight, about 1,750 pounds.**

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Entirely Exempt from Hemp or Jute. Softest and Most Pliable Packing Made. Does not lose its Strength when worn by the rod, and does not Scatter or diesolve by power of Steam or Water.

Sufficient for a Trial will be Furnished, Free of Charge.

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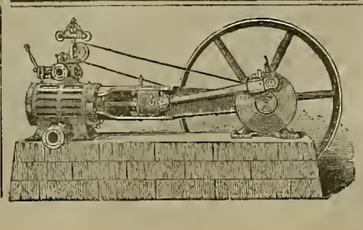

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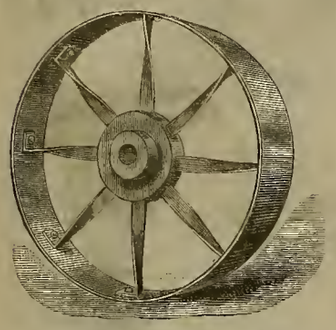
Heavy Automatic and Slide-valve Engines.
STATIONARY and PORTABLE BOILERS,
And Heavy Saw-mill Machinery.
....SOLE AGENTS FOR THE....
Skinner & Wood Portable Engines and Boilers

Iron and Machine Works.

MACBETH'S
—PATENT—
STEEL PULLEY.



Advantages of these Pulleys.

They are less than half the weight of cast-iron pulleys; are polished on the face; are made either crowned or straight, and are turned in the lathe the same as the best make of cast-iron pulleys.

They are carefully balanced. They are subject to no contraction strains, and can be run at very high speed without danger of bursting.

On account of their great lightness and the form of the arms, they absorb less power than any other pulley.

They are *the only pulley of the kind* which runs true. They cannot be broken in transport.

TESTIMONIAL:

MATHER LANE SPINNING CO. (Limited), LEIGH, ENGLAND, Nov. 5, 1883.

N. Macbeth, Esq. Dear Sir: The Patent Steel Pulleys supplied throughout to our No. 2 Mill are working to our entire satisfaction.

They are very true, and are about 50 per cent lighter than the cast-iron pulleys in our No. 1 mill.

Yours faithfully,
For the Mather Lane Spinning Co. (Limited),
(Signed:) RICHARD T. MARSH,
Managing Director.

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The undersigned are in receipt of regular supplies from Cardiff, Wales, and offer the COKE for sale in quantities to suit purchasers.

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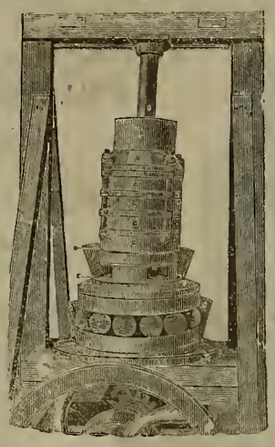

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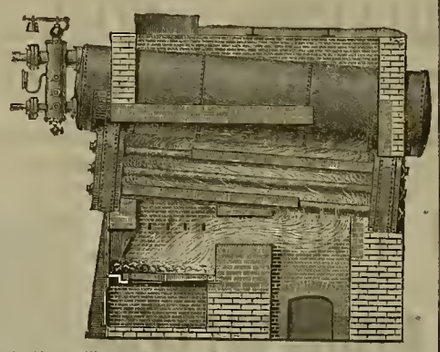

TESTIMONIALS.

ST. LOUIS, MO., Sept. 23, 1883.

Messrs Adolphus Meier & Co. GENTLEMEN: We cheerfully certify that the "*Heine Patent Safety Boiler*" put up by you in our establishment has proved very satisfactory in its working. The chief points of excellence in the "Heine Safety Boiler" are its economy in fuel and space, freedom from scaling, aptitude for power and heating purposes, working equally well with clear and muddy water. We warmly recommend it to all using steam machinery. Yours truly,

ANHEUSER-BUSCH BREWING ASS'N

OFFICE OF SUPT OF ROYAL RAILWAYS, BERLIN, Sept. 23, 1883.

To Mr. H. Heine, Civil Engineer: In reply to your inquiry of September 24, we respectfully inform you that the three boilers built under your patents, under steam since September 25, 1881, at the Alexander Place Depot, as well as the two at Friedrich Strasse Depot, under steam since September 22, 1882, have given good satisfaction, requiring no repairs whatsoever to date. The internal cleaning of the boiler was always accomplished with ease on account of the convenient arrangement of the tube caps, the adhesion of scales being fully prevented thereby, and the boilers kept in prime condition.

(Signed): BRAUCKE.

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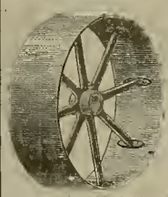

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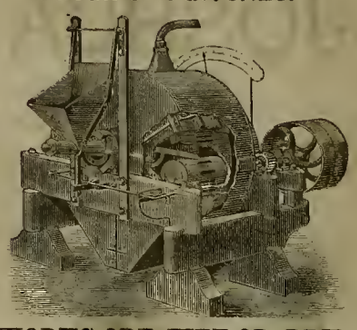

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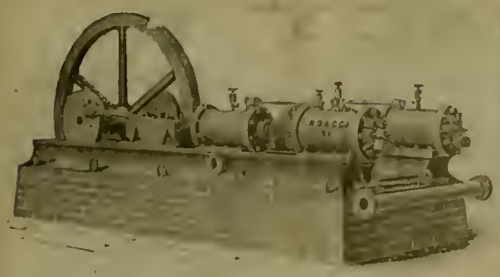

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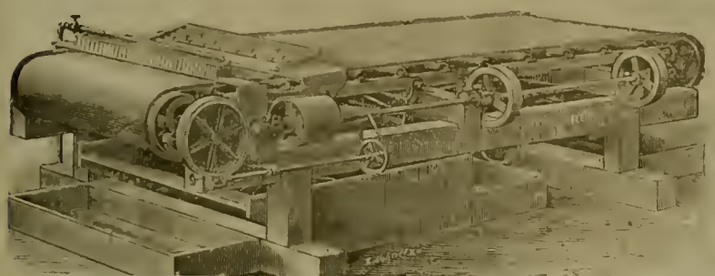

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PRICE: FIVE HUNDRED AND SEVENTY-FIVE DOLLARS, ($575 00), F. O. B.

OVER 1,000 ARE NOW IN USE. Saves from 10 to 100 per cent more than any other Concentrator. Concentrations are clean from the first working. The wear and tear are merely nominal. A machine can be seen in working order and ready to make tests at The Fulton Iron Works, No. 220 Fremont Street, San Francisco.

As the result of a suit tried against an End Shake Machine (the Embrey), similar to the Triumph, the Frue Vanning Machine Company owns the Embrey patent, and can put in the market an End-Shake Machine of earlier patent that will do as good work as the Triumph, and superior in construction and durability. There will be no risk of suit for infringement.

The Frue Vanning Machine Company warn the public that they claim and will prove the Triumph machine to be an infringement upon patents owned by them.

Protected by patents May 4, 1880, Dec. 7th, 1874, Sept. 7, 1879, April 27, 1880, March 22, 1881, Feb. 20, 1883, Sept. 4, 1883. Patents applied for.

N. B. We are and have been ready at any time to make a competitive trial against the Triumph, or any other Concentrator for stakes of $1,000.

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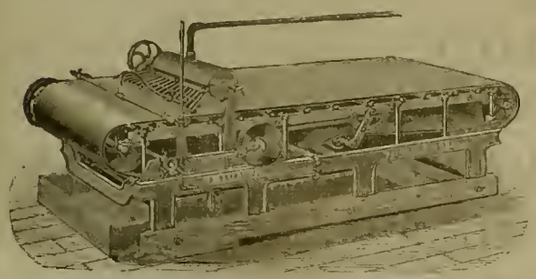

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These returns do not include the value of the amalgam saved by the "Triumphs" during the test, which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarily saved, which is lost on the "Frue" Vanners.

This trial was conducted under the personal supervision of the Manager and Superintendent of that Company, in a strictly fair and impartial manner, and with the sole view of determining, in the interest of that Company, the merits and demerits of the respective machines by a thoroughly practical test. A relation of the course of procedure, a concise analysis of assays, and a tabulated statement of the net bullion results, with accurate deductions therefrom, will soon be published in circular form.

The superiority of the present construction of the "Triumph" over the form originally introduced, together with the demonstrated results of the above, and other trials had with the "Frue" Vanners, induce us to and we hereby accept the Challenge of $1,000, thrown by the Agents of the "Frue Vanning Machine Company," and hold ourselves in readiness to enter into a second competitive trial for that sum, at such place and upon such terms and conditions as may hereafter be mutually arranged.

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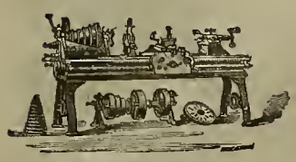
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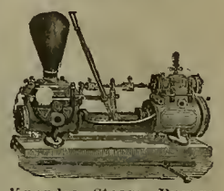
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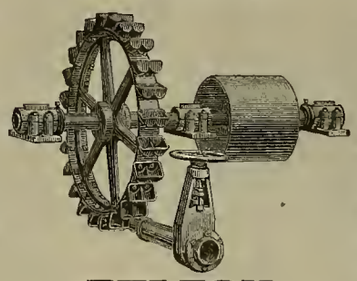

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Having associated with us able counsel at Washington, we are now prepared to obtain Patents upon Pre-emptions, Homesteads, Mines, Mexican Grants, and all classes of Land Entries; and to manage contests before the Commissioner of the General Land Office and the Secretary of the Interior. Advice will be furnished upon favorable terms. All business will be attended to promptly and on reasonable terms.

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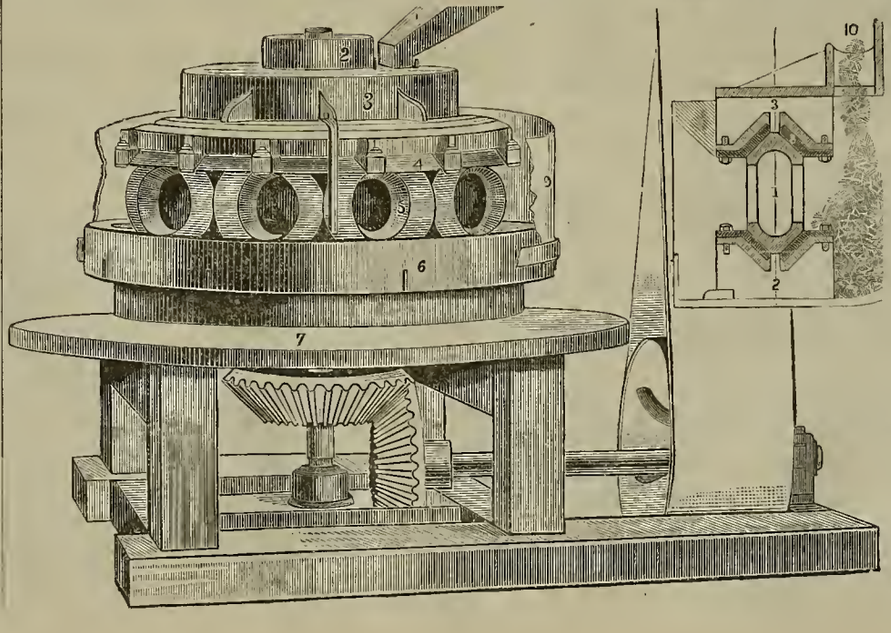

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Unequaled Results,
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, SEPTEMBER 13, 1884.

VOLUME XLIX. Number 11.

Town Sites and Mineral Claims.

In a certain application for patenting a mining claim in Montana, the Commissioner of the General Land Office held that the patent, if one should issue, should contain a clause reserving town site rights. The mining claim was located in October, 1874, and patent application filed August 4, 1881. The town site of Butte, near which the claim is located, was patented in 1877. A protest was filed before the Land Office setting forth that on account of the rapid growth of Butte City during the last eight years, "buildings and improvements of an expensive character have gradually extended eastward upon the public land, until at present, within the limits of what is now surveyed and claimed as the 'Lizzie Lode claim,' such improvements aggregate not less than $40,000." The protestants also declare that "until two years since we have been in ignorance of any interference with other claims." The claim was about 300 yards outside the boundary line of the town site.

In a previous decision on this subject by the Land Office it was held that a clause reserving town site rights should be inserted in the mineral patent, although in that case no application for the entry of the alleged town site appeared to have been made, it only appearing that a portion of the town in question covered the mineral claim.

The Secretary of the Interior in affirming the decision of the Commissioner of the Land Office says: "It would seem then that the Department had fairly decided that where there appeared to be a town settlement upon a mineral claim that the clause of reservation should properly go into the patent, even when such settlement was not protected by a town site entry; and that the actual rights of the claimants under the mineral location and the town settlement would depend upon priority of occupation. But in the Rico case it was held that this question of occupation must be left to courts of competent jurisdiction to settle, and that in the nature of things the Department could not be called upon to adjudicate such questions."

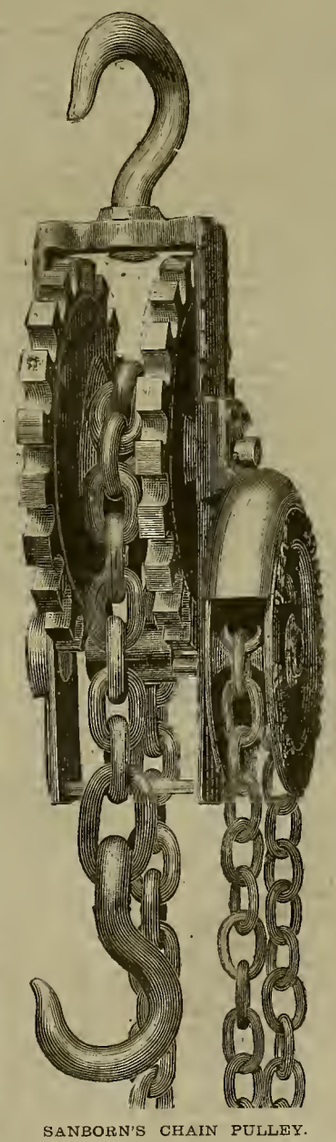
The Hale & Norcross, Savage, Chollar and Potosi Mining Companies have entered into a contract for another hydraulic pump to be set on the 3,000 level of Combination shaft. Its capacity will be 500 gallons a minute in forcing to the Sutro tunnel level, which is calculated as being 1,600 feet below the Gould & Curry croppings. The present depth of the shaft, from mouth to bottom, is 2,930 feet.

The Immigration Association reports that 700 immigrants came to this State during the past week. There were received at the association's rooms 106 samples of wheat from the different counties. The association will open a new room soon adjoining its present quarters, and here an exhibition of all the samples of different counties will be held.

The White Pine *News* says: We learn that the Cantou Company, whose property is located at Robinson, is negotiating for the purchase of the new mill of the Osceola Company. The mill cost $60,000, and is offered for sale at $10,000. If a sale cannot be made the machinery will be shipped back to the foundry at Chicago.

Sanborn's New Chain Pulley.

The engraving herewith illustrates a new lifting apparatus of that kind in which great power is necessary, and which will stand and hold the load at any point where it is left. As the engraving shows, there is a pulley over which the lifting chain passes, and upon the same shaft two gear wheels, so fixed that their teeth alternate—that is, the teeth of one wheel correspond with the spaces of the other. The pulley over which the actuating chain passes is fixed to shaft, which has short crank arms formed upon it, corresponding with the gear wheels and with the size of their teeth, so that when the shaft is rotated the crank arms or pins engage the teeth of the gear wheels, one after the other, and thus advance the chain pulley. This device also forms a perfect lock when left at any point. The frame of the pulley is made of malleable iron, and in it the gear and pulley shaft is supported, while below this the cranked driving shaft is journaled. On this cranked driving shaft, at one side, is fixed the chain pulley, having its periphery formed to prevent the driving chain from slipping. On the main shaft is fixed the double-gear wheels. They are placed side by side, and stand so that the teeth of one stand opposite the spaces of the other.



SANBORN'S CHAIN PULLEY.

The shaft carrying the driving pulley with its hauling chain has formed on it two eccentric pins or short crank arms, which stand on opposite sides of the axis of the shaft. The throw of these cranks or pins is fixed by the distance between the teeth of the gear wheels with which they correspond, so that as the shaft is revolved when the man hauls on the driving chain, the pins or cranks enter the space between the teeth alternately, and thus advance them and turn the shaft and hoisting-chain pulley. This hoisting-chain pulley is placed between the large gear wheels, which brings the weight right under the supporting book and balances the machine.

The pins or cranks in their revolutions pass over points of the teeth and into the spaces between them, without slip or lost motion, and with the least possible friction. When allowed to stand with a weight or load suspended from the chain, the pins will lie in the spaces between the teeth so as to form a perfect lock and prevent the shaft from turning back.

From the driving pulley, which is shown on one side, is the usual endless chain, which hangs within reach of the operator. There is a small hood placed over this pulley to prevent the chain coming off. It will be noticed that the operator may stand on one side and haul on the chain, and need not be right under the apparatus.

There are several features in this pulley, which in their operation appear to be important improvements over those usually made. The gear wheels are only touched once by the working crank, in each revolution, while in other geared pulleys they come in contact with the driving gear as many times in each revolution as the power is multipled. By this arrangement there is much less wear than is common. The gears are made of machine steel, while the ordinary pinions and driving gear in use is made of cast metal. In moving the apparatus, each crank is equal to half a cog. The device is simple, compact, strong and effective, and is quite ingenious in design. These machines have lately been put on the market, and are made here. The invention evidently simplifies, in a large degree, the construction of differential chain pulleys, makes them less in cost, weight, wear and repairs and easy of handling and operating. We consider the new device worthy of the attention of manufacturers and all users of such articles. The size for a half ton lift weighs only about 30 pounds.

The gold yield of Trinity county will approach very nearly to $1,000,000 for the year 1884. Much more has been taken from quartz this year than ever before.

E. D. Holland and James Gallagher, miners at Phillipsburg, Montana, were killed by a premature blast in the Granite Mountain mines a few days ago.

Prevention of Mine Accidents.

Two of the most common accidents to which miners are liable, are injuries resulting from breakage of hoisting ropes and from handling explosives. The condition of hoisting ropes at some mines are more carefully looked after: at others there is more or less neglect. Either the men appointed to look after them neglect their duty, or the ropes are run long after they should be renewed. An accident occurred at a Welsh mine recently by which twelve men lost their lives by the breaking of the hoisting rope. The matter was investigated, and it was found the wires in the rope were corroded and a large proportion of them so brittle that they broke at the slightest bending. The inspector concludes the reason the condition of the rope had escaped detection may be attributed to the fact that it was coated with a thick mixture of tar and grease, which masked the defects. In the result a verdict of "accidental death" was returned, and the jury recommended that all cages should be fitted with safety-catches; but as the inspector remarks, the question of safety-cages is not so simple as this suggestion would seem to indicate, and he adds that the conclusion that may fairly be deduced from the accident are: 1.—When human life is at stake on no account should a makeshift be resorted to. The capstan at the mine having no indicator attached its use was a decided makeshift. 2.—Every rope should be most critically examined before men's lives are trusted to it. 3.—A rope that has been subject to strains above its fair working load should never afterwards be used for raising or lowering men. 4.—The mixture of tar and grease commonly used in his district as a lubricant for steel wire winding-ropes tends to hide defects. Some more suitable material should, he says, be used, such, for instance, as a heavy mineral oil.

The Government Inspector for Cornwall, who made this examination, also gives some startling instances of the careless handling of dynamite. He states moreover, that many of the accidents which occurred in his district were owing to the instructions that accompany each box of dynamite not being sufficiently explicit. He pointed this out to the Chief Inspector of Explosives, who then called the attention of the Explosive Company to the matter, the result being an alteration in their instructions. The new instructions are: 1.—A wooden rod or squeezer should be used to push home the cartridges in the bore-hole. Never use a metal rod or rammer. 2.—Never ram or pound the charge home. It should be gently though firmly, squeezed into its place. 3.—Never squeeze the primer containing the detonation; but lower or push it gently, until it rests on the charge. 4.—Use sand or water tamping. 5.—In the event of a missfire, never attempt to draw the tamping. If water tamping has been used, put a fresh primer and detonator into the whole on the top of the charge. The explosion of the primer will set off the whole charge. 6.—If other than water tamping has been used, make a fresh bore-hole; but care must be taken to make it at a safe distance from the former hole, and in such a position or direction that the boring-tool cannot come in contact with explosive in, or escaping from, the hole that has missed fire. In all cases after a blast the material brought down, or blown out, ought to be carefully examined, lest any cartridges should remain unexploded.

The Physical Geography of California.

An Extract from Prof. Hilgard's Report.

The State of California lies between the parallels of 32° 30' and 42° north latitude, thus stretching though nine and a half degrees of latitude, corresponding to the difference on the Atlantic coast between Edisto inlet, South Carolina, and Cape Cod, Massachusetts. Its northern third lies between 120° and 124° 26' west longitude, the most westerly point being cape Mendocino, whence the coast trends southeastward, with a westerly convexity, toward San Diego bay. Between the extreme northwest and southeast corners the direct distance is 775 miles. The maximum width (between point Conception and the north end of the Amargosa range in Nevada) is 235 miles, and the minimum width (between the Golden Gate and the southern end of lake Tahoe) 148 miles. The total area of the State is 158,360 square miles. Its land area alone is 155,980 square miles, being second only to Texas among the States and Territories as now defined.

It is obvious that on this vast area the diversity of climates and of soils must be very great, and that only a very general outlining of these can be attempted within the limits of this report.

Topography and Drainage.

The climates of the several portions of the State are so directly dependent upon its topographical features, that an outline of those must of necessity precede any other discussion.

The two prominent features extending through nearly the entire length of the State are the snow-capped range of the Sierra Nevada, on the eastern border, and the low Coast range, or rather belt of ranges bordering the sea coast on the west. Between the two lies the great valley of California, drained from the northward by the Sacramento, and from the southward by the San Joaquin river, and these, uniting near the middle of the length of the valley, pass westward through the narrow strait of Carquines into San Francisco bay, and thence through the Golden Gate into the Pacific ocean. These two rivers receive nearly all their water from the Sierra Nevada, the streams flowing landward from the Coast range being insignificant. The main drainage of the Coast range is to seaward through many small rivers bordered by fertile valleys. The immediate coast is mostly abrupt and rocky, and frequently mountainous.

The maximum width of the great valley occurs opposite the outlet of the rivers, and in its southern portion, near the south end of Tulare lake, where it is over 60 miles. In its middle part the distance between the foot-hills of the two ranges averages about 40 miles; but to the northward these ranges gradually converge, the Coast range widening and becoming higher, while the Sierra narrows and, as a whole, becomes lower, though rising locally into the Lassen peaks, and culminating, as it merges into the coast ranges, in the great volcanic mass of Shasta. Northwestward the Siskiyou mountains form a cross range of considerable elevation, an effectual natural barrier between California and Oregon, while northeastward lies the barren "lava bed" plateau, with its numerous lakes. The great valley, may be considered as terminating northward at Red Bluff, Tehama county, although more or less valley land, but of a different character, occurs along the Sacramento river, as far north as Redding, Shasta county.

Southward the termination is much more definite. The Coast range and the Sierra being cross-connected, in a graceful sweep around Buena Vista and Kern lakes, by the Tejon range, beyond which to the eastward lies the great arid plateau of the Mojave desert. This range continues southward into the ranges of San Fernando, San Gabriel, and San Bernardino, all of which are often comprehended under the general but somewhat indefinite name of Sierra Madre, also applied far to the southward to the mountains representing the continental divide; but it would be better to comprehend the whole under the name of the San Bernardino range. Southward of this range lies the valley or plain of southern California, most of which is within the county of Los Angeles, with an outlier in the southwestern corner of San Bernardino, and is partly screened from the direct impact of the coast winds by a low coast range, the Santa Ana mountains, which is, however, traversed by the country drainage from the higher ranges. Toward San Diego county this coast range divides into a broad belt, dotted with smaller ranges and interpersed with valleys and table-lands, about 30 miles wide from the coast inland to the Mexican boundary.

Northward of the San Bernardino range lie the great Mojave and Colorado deserts, mostly high barren plateau lands, intersected by short abrupt mountain ranges, devoid of streams, and largely composed of sandy and "alkali" soils incapable of reclamation. To the northwest from the desert region numerous short water-courses descend from the steep eastward slope of the Sierra; but, although they create some fertile valleys adapted to agriculture, their volume is very small compared to the drainage of the western slope.

Geology.

Broadly speaking, the coast ranges of California consist of tertiary and cretaceous strata (mostly sandstones and calcareous clay shales), almost everywhere greatly disturbed, folded, and frequently highly metamorphosed, and traversed by dikes of eruptive and upheaval-axes of rocks. In the portion north of San Francisco these are frequently covered by tufaceous and scoriaceous or crystalline lava-flows, emanating from distinct volcanic vents now extinct.

In contrast to the Coast range, the Sierra Nevada has in general a central axis of granitic or other rocks (occasionally traversed by volcanic vents), on the flanks of which lie more or less crystalline and metamorphic slates or schists of Paleozoic, Triassic, and Jurassic age with edges upturned at a high angle or sometimes vertical. Abutting against this, the proverable "bed-rock" of the California miners, there lie on the eastern border of the great valley strata of marine deposits, mostly of the Tertiary, but northward of Folsom, Sacramento county, also of the Cretaceous age, which are but slighty disturbed, and into which the rivers flowing from the canons of the Sierra have cut their immediate valleys, flanked by bluffs from 40 to 70 feet high. From Tuolumne county northward, on the lower foot-hills, appear immense gravel beds, mostly gold-bearing, and these are partly overlaid by eruptive or volcanic outflows and tufaceous rocks, also accounted as belonging to the Tertiary age. In the northern portion of the Sierra region the eruptive rocks become more and more prominent, covering an enormous area ("the lava-bed") in the northeastern part of the State, and, as in the Cascade range in Oregon, forming the body of a comparative low range upon which the volcanic cone of mount Shasta is superimposed.

Apart from the Cretaceous and Tertiary beds on the borders of the great valley, there are within the valley terraces and bench-marks showing the existence in Quaternary times of a great fresh-water lake, which was subsequently drained by the erosion or breaking, first, of the strait of Carquines, and ultimately of that of the Golden Gate. Prior to the latter event the drainage of the great valley passed through the Santa Clara and Pajaro valleys into the bay of Monterey. Borings in the interior valley disclose materials varying from fine silts to sands and gravels, evidently deposited in the ancient lake. The latest surface deposits are, in the San Joaquin valley, mostly sandy, in the Sacramento valley more commonly clayey (adobe), corresponding to the composition of the coast ranges themselves, which in their interior southern portion show sandy materials more prevalently, while in the middle division clay shales are predominant, and form correspondingly heavy soils.

Since the agricultural features of California depend much more upon the topography than upon any details of geological structure, a more extended discussion of the latter would be out of place here. So far as relevant to the objects of this report, they will be referred to in the regional and county descriptions.

Winds.

The prevalent winds on the California coast are from the west, the influence of the Pacific ocean thus producing a climate in which the extremes of both heat and cold belonging to the several latitudes are tempered, so that on San Francisco bay and southward to Monterey the difference between the average temperatures of summer and winter is only from six to ten degrees. This equalizing effect is partly cut off from the interior valley by the Coast range, which also intercepts a portion of the moisture carried by these winds; the remainder is condensed mainly on the western slope of the Sierra Nevada, thus producing the arid continental climate of the interior plateau of Nevada. In the great interior valley the general direction of these winds is changed to "up-valley", that is, to a little west of south in the Sacramento valley and slightly west of north in that of the San Joaquin, a heavy westerly breeze blowing in, as a rule, through the joint outlet of both valleys, the straits of Carquines.

North of Cape Mendocino the direction of the prevaling currents is more from north of west, but south of the cape the direction is due west or slightly south of west, forming the "summer trade winds," which set in regularly some time in May and continue, with but an occasional interruption by a "norther," until October, laden with moisture from the warm, high seas. In summer these winds strike the cold Alaskan ocean current, which comes to the surface and sets in-shore off central California, producing dense fogs, which, during the summer months, frequently cover the coast country for twenty out of twenty-four hours for weeks together. Beyond a slight drizzle, however, no water falls; and as the fog banks drift against and up the slopes of the Coast range they dissolve quickly before the intense heat and dryness of the summer atmosphere in the great valley beyond. The moisture absorbed by the soil of the coast belt from these fogs goes far, however, toward maintaining the growth of the hardier herbaceous as well as of woody plants, no less than that of weeds, during the season of drought.

From May to October, both inclusive, south winds are very rare, but during the winter months they prevail largely, and bring the rains upon which the success or the failure of crops depend. The winter rain-storms are usually heralded by heavy weather in Oregon or in the Shasta region, whence the rain-wind works backward, so to speak, until it exhausts itself in the southern part of the San Joaquin valley, where the San Fernando range seems to form a partial weather divide, leaving the Los Angeles region more or less independent of the changes to the northward. Sometimes the rain-storm works chiefly down the coast leaving the great valley almost dry, in which case Los Angeles and San Diego usually get a fair proportion of its benefit. Sometimes prolonged and severe storms cover the entire State and extend far into British Columbia and Arizona. As thunder and lightning rarely form a part of the atmospheric disturbance, the rain usually falls gently and continuously, rather than in torrents, and thus chiefly soaks into the ground. Sometimes a fierce south wind drives it for a day or two, and then generally there comes a change; the wind gradually veers to the westward, then more rapidly to northwest and north, and with a heavy shower the sky clears suddenly and a "norther" sets in; though not ordinarily bringing a very low thermometer, it often feels bitingly and penetratingly cold, because its velocity and dryness, which cause rapid evaporation. Before the "norther" the surface moisture quickly disappears, muddy roads become as rough as if frozen, and compact ground cracks after a few days. Any long prevalence of this wind is looked upon with dread at all seasons, on account of the waste of moisture which it involves even when cold. In autumn and in spring, when its temperature is higher, the young grain often withers before it, and from May to September (when it is fortunately of rare occurrence) it sometimes becomes a veritable simoon, like the breath of a hot furnace, shriveling up the grain when in milk and sometimes almost curing the standing crops into hay. To the seaward of the Coast range the "norther" is rarely of long duration, three days being its ordinary limit; but in the great valley, and especially in the valley of the San Joaquin, it is both more frequent and persistent, occassionally blighting in a week all the hopes of the grain-grower not able to resort to irrigation, and even drying fruit on the trees. East winds are only of brief and local occurrence, being ordinarily cut off by the mountain ranges in their north and south course. They are usually the precursors of a "southwester," with rain.

Outside of the mountains the velocity of the wind rarely becomes so great as to endanger any well-constructed wind mills, which are therefore very generally in use as a motive power, especially for pumping water. In the absence of electrical disturbance hurricanes and "tornadoes" are scarcely known, save in the high Sierras, where local summer thunder-storms, sometimes accompanied by cloud-bursts, may be observed among the high peaks, in curious contrast to the unclouded brightness of the sky overhanging the valley.

Temperature.

The prominent characteristic of the California coast in respect to temperature is its remarkable temperateness as compared with points similarly located on the Atlantic coast. Taking stations at or near the extreme and middle points of corresponding latitude on both coasts, the comparison stands thus:

CALIFORNIA COAST.

Stations.	Summer.	Winter.	Year.
Camp Lincoln	59.5°	47.2°	53.9
San Francisco	58.0	50.1	65.2
San Diego	69.7	54.1	62.1

ATLANTIC COAST.

Stations.	Summer.	Winter.	Year.
Boston, Massachusetts	68.7°	28.1°	48.4
Cape Charles, Virginia	74.3	35.8	56.0
Edisto, South Carolina	81.0	46.6	64.3

It will be noted that while the annual averages of corresponding points on the two coasts are not very widely different, the temperatures of summer and those of winter are very much farther apart on the eastern coast than on the western, and quite as strikingly so in the northern as in the southern portion of the respective regions. This exemption from extremes of temperature constitutes one of the great attractions of the Pacific coast.

In the interior, notably in the great valley, the seasons show greater extremes of temperature, but the greater range of the thermometer is largely offset by the fact that the dryness of the atmosphere renders the changes much less sensible than is the case in the moister air of the coast. It is thus at San Francisco, which presents the extreme of the coast climate on account of its peninsular position and the access of the sea air through the Golden Gate, those familiar with the climate making a careful distinction between the sunny and the shady side of the streets in walking, and hay windows, of necessity, take the place of porticoes or porches, which would rarely be available save in the middle of the day, while in the interior, porticoes are universal, and camping out under a tree all night may be indulged in with impunity by any one during the dry season.

As to the change in temperature in ascending the Sierra from the valley, the following statement is made by Mr. B. B. Redding in a paper read before the California Academy of Sciences in 1878:

It has been found that the foot-hills of the Sierra up to the hight of about 2,500 feet have approximately the same temperature as places in the valley lying in the same latitude. It has also been found that with increased elevation there is an increase of rainfall over those places in the valley having the same latitude, as, for instance, Sacramento, with an elevation above the sea of 30 feet, has an annual mean temperature of 60.5° and an average rainfall of 18.8 inches, while Colfax, with an elevation of 2,421 feet, has an annual mean temperature of 60.1° and an annual rainfall of 42.7 inches. This uniformity of temperature and increase of rainfall appears to be the law throughout the whole extent of the foot-hills of the Sierra, with this variation as relates to temperature, viz., that as the latitude decreases the temperature of the valley is continued to a greater elevation. To illustrate, approximately, if the temperature of Redding at the northern end of the valley is continued to the hight of 2,000 feet, then the temperature of Sacramento, in the center of the valley, would be continued up to 2,500 feet, and that of Sumner, at the extreme southern end of the valley, to 3,000 feet.

It is curious to note that, as appears from Mr. Redding's statement, the lowest temperatures thus far observed at the two opposite ends of the valley, Redding and Sumner, are the same, viz., 27°.

In the southern region the difference between the summer means or between winter means, as well as between the annual means, is quite small when Santa Barbara and San Diego, both lying immediately on the coast, are compared. At Los Angeles, 20 miles inland, all these means are notably higher; still farther inland, and with increasing elevation, the summer mean rises, while the winter mean falls at Riverside, as well as more strikingly at Colton, although at the latter point the annual mean is almost the same as at Los Angeles.

To convey an easily intelligible idea of some of the climatic differences, it may be stated that while in the great valley a few inches of snow cover the ground for a short time nearly every winter as far south as Sacramento, and snow flurries are occasionally seen even at the upper end of the San Joaquin valley; snow has fallen in the streets of San Francisco only once since the American occupation to such a depth as to allow of snowballing (which, during a few hours, create a state of anarchy) and only a few times has enough fallen to whiten the ground for a few minutes or hours. Hence the heliotrope, fuchsia, calla lily, and similar plants endure year after year in the open air, while at a corresponding latitude in the interior they require some winter protection. Lemon and orange trees never suffer from frost on the bay, but their fruit also rarely ripens, save in favored localities. In the interior these trees more frequently suffer from frost, but the high summer temperature matures the fruit some weeks earlier than even in the southern coast region. Cotton would, as a rule, be frost-killed in the great valley in November, while on the coast in might endure through several mild winters; but within reach of the summer fogs of the coast it fails to attain a greater hight than eight or ten inches the first season, and sometimes can scarcely succeed in coming to bloom before October. Subtropical trees, which in the cotton States grow rapidly and luxuriantly—such as the crape myrtle, Paulownia, Catalpa, Mimosa (*Julibrissin*), and others—either grow very slowly or remain mere shrubs in the coast climate, while in the interior they develop as in the Gulf States. The vine flourishes near San Francisco, but fails to mature its fruit; yet it yields abundant and choice crops near San Jose, where the immediate access of the coast fogs is intercepted by a range of hills. It is thus obvious that, with the varying topography, the change of the direction of a valley or a mountain range, the occurrence of a gap or of a high peak in the same, permitting or intercepting communication with the coast on the one hand, or with the interior on the other, there exist innumerable local climates, "thermal belts," sheltered nooks and exposed locations, each of which has its peculiar adaptations apart from soil, and the recognition and utilization of these adaptations require knowledge and good judgment, and count heavily in the scale for or against success in agriculture in California.

Rainfall.

As regards the rainfall, the prominent peculiarity throughout the State is the practically rainless summer. While it is true that rain has been known to fall in every month in the year, the average amount of precipitation during the three summer months is less than one inch in the greater portion of the State, and less than two inches even in the most favored part, viz., the counties just north of San Francisco bay. Frequently not a drop of rain falls in the interior valley and the southern region from the middle of May to November, and as the agricultural system of California is based upon the expectation of this dry weather, summer rains are not even desired by the farmers at large. Northward, in the mountainous and plateau regions adjoining Oregon, the season of drought becomes shorter, as is also the case in the high Sierras, and thus there is a gradual transition toward the familiar *regime* of summer rains and occasional thunder storms which prevail in Oregon and Washington west of the Cascade range.

DURING the year ending April 1, 1884, the Copper Queen Mining Company (Arizona) smelted 33,941 tons of ore, averaging 11.26 of black copper, produced and marketed at a cost of 9.37 cents per pound. The net value of the bullion produced at New York was $1,033,045.62, upon which the net profit was $342,946.07. To pay $400,000 in dividends, the company, therefore, drew in part on its reserve, which at the end of the fiscal year was $159,974.58. This report is interesting, as showing what margin of profit there is in 11.26 per cent copper ore in Arizona.

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[1] An abstract of the Introductory Chapter of the "Report on the Physical and Agricultural Features of the State of California," by E. W. Hilgard, Ph. D., published by Dewey & Co., and furnished to subscribers to the PACIFIC RURAL PRESS, as stated in announcements in other columns.

MECHANICAL PROGRESS.

Driving by Friction.

For many purposes for which gear wheels were formerly used, surface friction wheels are now employed. If the surfaces are properly matched as to material, and are sufficiently large as to area, there appears to be no reason why friction wheels cannot be more extensively employed than they have been heretofore. One of the objections has been that there must be an end thrust, which by its friction absorbs much of the power. It is a baseless objection, as may be seen in the friction clutch of the overhead counter-shaft of the lathe, and in many other situations where the release of the friction is the easiest and most natural movement. To be sure, in this case the amount of contact is very large (the entire circumference of the pulley), but the principle is the same; for where the pulley friction clutch must be held as a one with the moving pulley, so the friction wheels are one so long as they are in contact, and their contact is a mere point against the circumferential contact of the pulley clutch.

An objectionable method of employing the friction driving is to use a metallic surface against a wooden or a leather surface. Two surfaces of wood are better; but if iron and leather or iron and wood are used together, the driver should, in all cases, be made of the softer material, for when the driver is thrown in contact with the driven, it must make a number of revolutions before its contact will be sufficient to start the driven wheel. It is evident, therefore, that if the driver is of iron while the driven is of some softer substance, it (the driver) will wear a crease that will injure the surface of the driven wheel. It is much better, where it is practicable, to make both the driving surfaces of wood.

Excellent wheels are made of maple—hard rock maple—and of lignum vitæ, the lignum vitæ wheel to be the driven and the maple the driver. The wheels should be a cast-iron spider made to receive the wood, which should be sawed into wedge-shaped or radial segments, so that the end grain of the wood bears and makes the contact surfaces. Excellent results have been obtained, also, with hard rubber (vulcanized) and wood, where there was no oil to rot the rubber; and for small wheels there is nothing better than rawhide as prepared for pickers for looms and for small gears. This will stand oil and resist its disintegrating influence.

One of the advantages of friction wheels over cogged wheels is that when they are started there is no shock, but only a gradual coming up to speed. Another is their noiselessness; but the epicycloidal cutting of gear teeth latterly has made this objection untenable, as gears can be run as silently as belts. But a great advantage is the very slight movement necessary to connect and disconnect, the actual surfaces requiring to be merely and barely separated to insure a stoppage of motion.

Variations of Speed.

In connection with the above, which we clip from the *Scientific American*, we copy the following from the same paper, in regard to variations of speed by the use of friction: The contrivance of step cones with shifting belts is a cumbersome and troublesome one for procuring gradations of speed. In many cases it answers its purpose, but in others some more sensitive and intermediate device would be better. A change of speed is readily obtained by a change of position of a driven friction wheel on the face (side) of a driver wheel or disk. The face of this disk may be either straight or slightly dished, and the driven roll or small pulley traverses the face of the disk from the shaft to circumference. It is evident that while the driven wheel is nearest the shaft of the disk it will revolve the slowest; and also it is evident that as the driven wheel is run out toward the circumference of the disk it will revolve the faster.

The shaft of the driver—the disk—is, of course, at right-angles to that of the driven pulley. These relative positions must be maintained. But it does not matter, in practice, whether the disk is on a horizontal or a vertical shaft, so long as the driven is so arranged as to be permitted to be placed in contact with the disk at any point from center to circumference.

This device, with some modifications, has already been employed in the machine driving of potters' wheels and in the foot driving of sewing machines. But it is capable of a wider adaptation, especially in the machine shop, where sudden changes or quick variations of speed are frequently necessary. The large disk may be of cast iron, turned and finished, and the driven wheel of iron, leather faced, or of wood. The progress of the driven wheel from shaft to circumference of the disk—from low speed to high speed—could be controlled by lever, worked by hand or by foot treadle. It is a much closer and more sensitive device than the present system of absolute changes of speeds on our lathes and drilling machines.

ELIMINATING GASES FROM STEEL INGOTS.—A new and simple device has been introduced for the elimination of gases from steel ingots, during the process of casting. This is done by leaving the upper surface of the ingot mold open and freely exposed to the atmosphere and at the same time so shaping the ingots and ingot molds that this upper surface is the largest or nearly the largest surface of the ingot, the ingot itself forming a comparatively thin layer of steel which form ingots of Siemens-Martin or Bessemer steel have hitherto been made. The result of this process is that the gases carried into the ingot mold with the fluid have but a short distance to rise before reaching the upper surface of the ingot and making their escape, so that the steel solidifies practically free from those gases. The advantage thus gained is obvious, for no hammering is required before rolling, as the ingots only require to be reheated before they are passed through the rolling mill. The device has been patented in England by Messrs. William Beardmore and James M. Cherrie, who claim in their specification the casting of steel into ingots of a shallow or flat shape, so that there is in the ingots a thin or shallow, as distinguished from a thick, depth or length of liquid steel through which the gases have to escape, and whereby the escape or elimination of the said gases is substantially facilitated.

Preservation of Cast Iron.

The common practice of painting the unfinished portions of machines is not very attractive, and that of making all cast iron of some uniform color for all machines is almost offensive. In most cases the use of paint on the cast iron is intended to make a contrast between the unfinished material and the polished parts; incidentally, it is also to prevent oxidation and a blotchy appearance. But if the oxidation is general and even, and permanent, nothing could be finer; for the red oxide of iron is even more agreeable to the eye than the blue green oxide of copper or bronze, which is so much admired. There is no question about the durability and the permanency of iron oxide in color and texture any more than that of bronze or brass; the browned gun barrels of fowling-pieces are instances.

Experiments have been made to avoid the daily annoyance of paint by less mechanical means. The cast iron, after being pickled to remove the scale, was left to dry with the acid still on it. Then it was cleaned with a wire brush, and scraped with a coarse file. The result was a mottled surface, the lower portions being a grayish brown, and the outer or upper portions bright. The surface was then swabbed with crude petroleum, and before it was dry was rubbed with a wire brush. Such treatment insures an unchangeable surface and gives an agreeable color. Even without the petroleum the rust of the acid insures a very pleasing and permanent effect; but the petroleum prevents after stains, and mellows and blends the tints. In either way used it is an improvement on paint. Cast iron has a beauty of its own that is no more dependent on paint than that of bronze or brass.—*Exchange.*

STEEL MADE AND RE-WORKED.—Some tests have been made of steel from the roll and from the hammer as compared with steel that is annealed and turned to size. It appears from these tests that the commercial steel, untouched by annealing heat, or by the turning tool, is better in its resistant qualities than the annealed and turned material. Unannealed steel is tougher—it resists torsion better—than annealed steel. This fact was constant through a large number of tests of the steel made by five of the most prominent and best known manufacturers. Further trials proved the fact that steel as it comes from the hammer is better for certain tools than the same steel annealed, turned, and after worked. A square bar of commercial steel centered and cut to thread made a better tap than the same bar annealed and turned round, and then four-scored and re-tempered. It is possible that for certain tools—lengthwise tools—as taps and reamers, steel might be forged in bars to size and shape, with advantage, not alone as to saving of lathe work, but as to value of the finished tool. If steel makers can be induced by sufficient orders, it is probable the experiment will be made on a scale large enough to establish the question of its value. The claim of those who have made the tests is that the "skin" of the steel as it comes from under the hammer is stronger than any after coating by the oxidizing of tempering. —*Scientific American.*

TURNING BESSEMER STEEL.—A job in a machine shop of Bessemer steel worked in the lathe with the ordinary turning tool would not come out right; the material appeared to lack tenacity, it crumbled when brought up by the turning tool to an edge. As an instance, some axles for cars on an elevated railroad were scored circumferentially. They were made of excellent Bessemer steel. The scores, somewhat more than a quarter of an inch deep, were turned in the usual way, but before the vees could be finished to a depth of about five-sixteenths of an inch, the metal crumbled at the top of the vee, and the entire job had a ragged look. It was found that the only way to do a good job on this material was to make a collection of toothed mills, and mill the scores instead of turning them. If the axles had been made of tenacious material like Norway or Lowmoor iron, there would have been no difficulty in cutting clean vee scores possessing all the toughness of the solid material.

A NEW PROCESS IN SHOT MANUFACTURE.—A new process in shot making will do away with the tall towers. A strong current of air is forced on the lead as it falls into the water.

SCIENTIFIC PROGRESS.

A New and Valuable Solvent.

What is said to be a valuable preparation in which petroleum forms the chief ingredient has recently been patented in England. The invention relates to the production from petroleum of a substitute for bisulphide of carbon which can be used for extracting oils and anthracine, for dissolving gums, resins and analogous substances, for water-proofing, and for vulcanizing india-rubber in conjunction with chloride of sulphur or other vulcanizing agents. To obtain the improved substitute, which is called "vulcoleine," the distillate or fraction from petroleum which passes over between the temperatures of 100° and 212° F. or thereabout (the fraction known as spirit or naphtha) is taken and treated in the following manner: To every 100 gallons of petroleum is added from two to three gallons of sulphuric acid with constant agitation, continued as long as may be necessary, in a suitable vessel; it is then allowed to subside, and the liquor decanted from the sediment is run into a still with from one to two per cent of its weight of lime or other dehydrating medium, calcium carbonate or other alkaline carbonates or oxides of metals capable of removing or destroying any sulpho-oils which may have been generated by the treatment with sulphuric acid. The distillation is conducted without injecting steam or water into the contents of the still. Sometimes before distilling, the liquid is submitted to repeated treatment with fresh sulphuric acid until the acid ceases to be colored, or nearly so. As the distillate comes over, the receivers are exchanged as soon as the product which is coming over reaches a specific gravity from about 680 to 690, water being taken as 1,000. By these processes the portions of petroleum unsuited for a substitute for bisulphide of carbon are removed and considerable economy is thereby effected, both in material and bulk of liquid to be operated on.

THE CAUSE OF EARTHQUAKES.—A good deal of thought has been expended in weaving theories to account for earthquakes, without any of them being entirely satisfactory. Professor Newcomb thinks he explains the cause when he says: "The fluid matter beneath the earth's surface in cooling contracts, leaving a vacant space between it and the solid portion, causing the heavier parts above to sink, and an earthquake results." Professor George H. Merriman, of Rutger's College, New Brunswick, has also a theory on the subject. It is this: The crust of the earth floats on and imposes an immense weight on a liquid substance, which is inconceivably hot. Now, as to the way an earthquake may be caused. Suppose moisture trickled gradually, year after year, through this crust into the heated mass. In our atmosphere steam would be produced. Thirty miles below us the pressure is so great that it is not likely that steam could be generated. One thing, though: the pressure of 10,000 tons to the square foot, a pressure exerted in every direction, would be increased. Some effect must be produced down there, and it is easy to see that if one place in the earth's crust is weaker than another near the region where the water trickled in, "the weakest place must stand the strain." It is not unreasonable to suppose that this pressure below might be so great that the earth's covering was shifted a little to adapt itself to the pressure from below. This shifting of the crust is, in fact, the earthquake. I believe this theory has the greater reason on its side, because earthquakes are almost always in the region of volcanoes, and volcanoes are almost always in or near the ocean.

INVISIBLE WIRE.—Platinum wire has been drawn so fine by H. F. Read, of Brooklyn, as to be invisible to the naked eye, although its presence upon a perfectly white card could be detected by the touch, and could be seen with the aid of a small magnifying glass when the card was held in such a position that the wire cast a shadow. A small platinum wire about No. 18 was inclosed in a close fitting tube of silver. The tube was made by taking a long and narrow sheet of silver, about one-twentieth of an inch thick, folding it over into a cylinder, and drawing down until the wire would just fit in it. This was then drawn down until the tube containing the wire was only as large as the original wire. A short length of this was cut off, and incased in a second tube of silver, which was drawn down in the same way. This operation was repeated until the platinum wire had been reduced sufficiently in diameter. The last wire was drawn as fine as the dies would permit, when the silver coating was removed by an acid. During the work it was necessary occasionally to anneal the wire. It was designed to be used for cross wires in telescopes, its opacity and fineness rendering it particularly applicable, but its extreme weakness made its handling almost an impossibility.

A SCIENTIST'S CHEERFUL WORKSHOP.—A biography of Louis Pasteur, just completed by his son-in-law, gives the following description of the surroundings of the great French investigator at his daily work: All the animals in the laboratory, from the little white mice hiding under a bundle of cotton wool to the dogs barking furiously from their iron railed kennels, are doomed to death. These inhabitants of the place, which are marched out day after day to be subjected to operations, or other experiments, share the space with still more ghastly objects. From all parts of France hampers arrive containing fowls which have died of cholera or some other disease. Here is an enormous basket bound with straw; it contains the body of a pig which has died of fever. A fragment of a limb, forwarded in a tin box, is from a cow which died of pneumonia. Other goods are still more precious. Since Pasteur two years ago went to Pauillac to await the arrival of a boat which brought yellow fever patients, he receives now and then from far-off countries a bottle of black vomit. Tubes of blood are lying about, and plates containing drops of blood may be seen everywhere on the work tables. In special stores bottle-like bladders are arranged. The prick of a pin into one of these bladders would bring death to any man. Inclosed in glass prisons millions and millions of microbes live and multiply.

SALICYLIC ACID IN BEER.—Some interesting experiments by Heinzelmann have been published, which offer additional proofs of the value of salicylic acid as a preservative agent, for they show that this antiseptic, when used judiciously, really strengthens and encourages the growth of yeast. The author's experiments show that, although the vitality of the yeast is completely destroyed by the presence of 0.05 per cent of salicylic acid, the addition of only 0.01 per cent actually favors its greatest activity, and further, that the yeast cells developed in the presence of this proportion of salicylic acid are stronger and larger than those produced in a solution free from this acid; moreover, the production of alcohol in a given time is said to be greater. The addition of one part of salicylic acid to 10,000 parts of the mash is said to favor fermentation, especially when sugar is used. In two series, each of three experiments, Ladrean employed (1) beer alone and beer mixed respectively with (2) 100 and (3) 200 grains per barrel. The three beers were exposed to the air for two weeks, and subsequently closed up for a month, after which period they were examined. The beer 1 without salicylic acid was sour, beer 2 was only slightly sour, and beer 3 not at all. To complete the investigation, the salicylated beer was employed for dietetic purposes for several weeks without any deleterious effect on the health of the experimenter. It is therefore clear that the addition at most of 250 grains (about one-half ounce) per barrel preserves the beer without affecting its use as a beverage. The author defends the use of salicylic acid, and maintains that a prejudicial amount would never be added, owing to the facility with which salicylic acid may be accurately estimated.

A HOUSE OF THE STONE AGE.—A very interesting discovery of a house of the stone age was recently made in a marsh at Schulsonried, in Wurtemburg. The house or hut was still preserved; the flooring and a part of the walls were intact, and, as appeared from a careful admeasurement, had formed, when complete, a rectangle, 32x23 feet. The hut was divided into two compartments, communicating with each other by a foot-bridge made of three girders. The single door, looking toward the south, was about three feet wide, and opened into a room 19 feet long by 12 feet wide. In one corner lay a heap of stones, which had apparently formed the fireplace. This room was the kitchen, "the living-room," and probably a night refuge for the cattle in cold weather. The second room, which had no opening outside, measured about the same, and was, no doubt, used as the family bed-chamber. The floors of both rooms were formed of round logs and the walls of split logs. This, be it remembered, was a hut of the stone age. It may be safely presumed that the lake dwellings of the bronze age were larger in size and less primitive in their arrangements. At both periods the platform supporting the houses communicated with the shore by means of a bridge (probably removable at pleasure), and with the water by ladders. These ladders, as appears from an example found at Chavannes, were made of a single stang with holes for the staves, which protruded on either side.

A NEW MOTOR.—The scientific commission of the Vienna Electrical exhibition has recently made very satisfactory trials with a so-called "Hock motor," manufactured by Messrs. Hock & Co., of Vienna. The motor consists of an air-tight fireplace, whose fire is fed by compressed air; water is injected into the resulting gases of combustion, and the resulting mixture of steam and combustion products, which the inventor calls "air steam," is led directly into the engine. We have therefore machinery without a boiler. The results of the trials were exceedingly gratifying. The machine, of six normal horse power, developed 12.23 effective horse power, with a consumption of coal of 2.2 pounds per hour for each effective horse power.

THE late Java earthquake has been minutely studied by a Dutch engineer, officially sent out by the government, and his report gives most interesting details respecting the causes and effects of the volcanic eruptions in Sunda straits. Beginning on August 26th, they attained their maximum on the 27th, when the sound of the reports could be heard in Ceylon and Australia, thus traveling over a surface of 2,049 miles, and forming a circle representing the fifteenth part of the whole surface of the globe.

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Passing Events.

The latest mining news of moment is the discovery of gold fields on the Little Rocky Mountain, about 100 miles east of Benton, Montana. Already a stampede has set in, and some tall stories are telegraphed about the diggings.

Another hydraulic pumping outfit has been ordered in this city for the Hale & Norcross, Savage, Chollar and Potosi mining companies, on the Comstock. It is to handle 500 gallons of water a minute. These pumps, at first distrusted, are found to work well and economically. The Combination shaft is already equipped with hydraulic machinery down to the 2800 level, and with the new pump the system will be extended to the 3000-foot level.

The local Mechanics' fair has closed, and the State fair at Sacramento is in full progress.

The people of California, on Tuesday, celebrated the anniversary of the admission of the State into the Union by a holiday. The corner-stone of the new building, in this city, for the use of the Society of California Pioneers was laid with appropriate ceremonies.

ASSESSMENTS due on mining stocks this month in this city aggregate $203,550. Of this amount the mines of Nevada call for $156,500, of California $35,000, and of Utah $4,000.

THE assessment now due on the Utah mine stock, is the fiftieth levied; that on the Alta is the thirtieth.

Antimonial Ores.

Among the metallic and other minerals found associated with auriferous rocks, is antimony. With gold or antimonial ores it is possible to extract both the gold and the antimony. If antimonial ores are burned in kilns or roasting furnaces, either for the purpose of rendering the quartz more friable, or for getting rid of the antimony minerals, there is always a partial reduction when the heat is very great and free access is given to atmospheric air. This reduction of ore producing metallic antimony is due to two causes—(1) the carbon of the fuel coming in contact with antimony oxide, either native oxide or that produced on the furnace by the oxidation of the sulphide, reducing it to a metallic condition; (2) by the action of the oxide on the sulphide, producing sulphurous acid and metallic antimony.

Metallic antimony has a great affinity for gold. It forms an alloy either when the two metals are melted together or when the vapor of antimony is passed over heated gold. The alloy produced is gray in color and very brittle, and amalgamates with mercury only after long contact and continual grinding, or by heating the two together. The amalgam when formed floats on mercury, and gradually gives up metallic antimony as a fine powder when agitated with water. This antimonial powder carries off a quantity of mercury and gold amalgam entangled with it.

Antimonial sulphide is one of the worst minerals with which the quartz worker has to deal. It divides the mercury into a black "flour" even more quickly than arsenical pyrites; and if the flour is triturated with the intention of bringing the globules of mercury together, a chemical combination takes place. The mass gradually changes color, passing from the original blue-black or dark gray to a pure black, and then through brown to a brown-red. Upon examination, Cosmo Newberry finds that the remaining mercury contains antimony, and that the brown-red, non-metallic portion consists of a mixture of undecomposed antimony sulphide and mercury sulphide. Sodium amalgam he finds worse than useless in bringing together the globules of mercury floured by antimony sulphide.

The process adopted by the Costerfield Co. (Victoria, N. S. W.) for treating these ores, consisting of sulphide and brown and white oxides of antimony, is as follows: The portion of the ore free from quartz is picked out and set aside for smelting, the remainder being crushed to extract the gold. The tailings are then conveyed to heaps and prepared for smelting by a process of puddling. A sluice-box is fed with tailings, which pass on to a triangular tray, forming an inclined flume, so arranged as to cause the water and tailings to flow over it in a broad, shallow stream, into an oblong receiving pit. The purest antimony ore, from its greater specific gravity, settles in the pit at the end nearest the tray. As the sediment recedes from this end it gradually becomes mixed with an increasing proportion of sand; but much of the latter is carried away in the overflow of water from the pit.

On cleaning out the receiving pit, that portion of its contents containing quartz sand is returned to the heaps, to be again passed through the buddle, and the pure ore is collected in bags and sent to the boiler-house to be dried. It is then placed in a smelting furnace, with equal proportions of uncrushed ore, and reduced to crude antimony (sulphide), the slag and cinder resulting from this process being further treated by roasting or calcining in a reverberatory furnace to liberate the oxide, which passes off in fumes from the furnaces into the oxide flue; and as the fumes cool on their passage to the smoke-stack, the oxide is deposited in chambers constructed in the flue to receive it. The residue from the reverberatory furnace is afterwards crushed to extract any gold it may contain. The gold obtained from the mineral defrays the whole of the company's working expenses, and the yield of crude antimony and oxide is clear profit. The ore yields about 45 per cent of crude antimony.

The process adopted for treating auriferous ores containing antimony sulphide, by fusing the sulphide with a portion of metallic antimony, and using the same metal with fresh charges of the ore, until it becomes rich in gold, and then separating the two metals by the oxidation of the antimony, while suitable for rich antimony ores, will not answer for those containing less than per cent of the sulphide, as they are too silicious to fuse. Hence, only large quantities of poorer auriferous antimony ores do not yield half than gold to ordinary processes, and do not return any antimony when worked for gold.

According to Lock, Mr. Cosmo Newberry has introduced the following method for treating such ores, which may also contain gold, silver, nickel, cobalt, sulphur and arsenic. The uncrushed ores are placed in a kiln or furnace with a quantity of salt sufficient to produce the amount of chlorine necessary to get rid of the sulphur, antimony and arsenic. As soon as the calcination commences a supply of steam or aqueous vapor is conducted to the bottom of the kiln or into the furnace, in such quantities as to keep the whole mass saturated. That it is so saturated is ascertainable by holding a condensing surface, such as a piece of cold iron, over the calcining mass; if the saturation is being effected, the surface soon becomes damp. The saturation is continued until there are neither antimonial nor arsenical fumes, nor the smell of sulphurous acid or sulphureted hydrogen. The process is then completed, and the charge is drawn; it is ready for any further treatment for extracting the precious metal. A peculiar condenser for facilitating the solidification of the metallic vapors given off in these evasting processes has been perfected by the introduction of the process described.

A New Rock Breaker.

George H. Malter, of the well-known firm of quartz mill builders of this city, has received, through the MINING AND SCIENTIFIC PRESS Patent Agency, a patent on a rock breaker which has several new features. The machine has the ordinary frame, with one fixed and one movable jaw, each being provided with suitable dies or crushing faces. The lower jaw has its lower end fitted to turn upon a shaft which extends across the frame, and the upper end of the jaw is oscillated by a crank, cam or eccentric.

Mr. Malter shows two constructions for compensating for wear. In one an eccentric shaft is used, and in the other a straight shaft with eccentric journals. By the first construction, in order to adjust the lower end of the jaw toward the fixed one, to compensate for the wear of the dies, the shaft has its central portion turned eccentric to the ends, which are supported in boxes upon the frame. The lower end of the jaw is fitted to the central portion of the shaft, so that the latter may be turned around it. It will be manifest that when the shaft is turned the eccentric portion will cause the lower part of the jaw to advance or recede as desired. In order to produce this movement the inventor employs a lever or other suitable mechanism connected with the shaft. One end of this lever is rigidly fixed to the shaft, while the other extends upward far enough to give the necessary power to turn the shaft, and it is arranged so as to be held at any desired position. Gibs are fitted to the journals of the shaft, and made tight by keys. When the shaft is to be turned around, these gibs and keys are loosened, and the lever moved to advance the jaw to the desired point of adjustment. The keys and gibs are again tightened, and the shaft and jaw will be held firmly in its new adjustment. In this manner the jaws may be kept at the desired distance apart, and the wear of the dies compensated until they are worn so thin that they must be renewed.

In order to produce a surface which will wear less rapidly than ordinary dies, Mr. Malter forms dies of cast-steel having parallel slots made transversely on them at short distances apart, and extending nearly, or quite, from side to side of the dies. Within these slots are fitted steel bars made harder than the metal of the die; and this surface will resist abrasion, which the unequal wear of the dies and bars will produce, transverse ridges which will keep the rock from jumping out of the jaws while being crushed, which is an advantage.

In order to prevent the breakage of important parts under excessive pressure, the cap, which is holted to the upper part of the movable jaw, against which the arm from the operating eccentric presses, is made hollow, and a block of rubber is placed within it. If any unusual pressure takes place, the socket upon which the pressure is exerted gives way, and the pressure is thus absorbed by the elastic rubber block beneath, and is not communicated to the jaws. The machine may then be stopped without further injury, the impediment removed, and a new cap substituted. Other forms of breaking-pieces may be used, but this is very suitable.

An Important Patent Decision.

Judge Sahin, United States District Judge for the State of Nevada, has rendered from the bench of the United States Circuit Court in this city, a decision of much interest in the case of the Salamander Felting Company vs. Benjamin S. Hill and William Gould. The suit was brought to restrain defendants from alleged infringements of certain patents which are for a plastic compound material for covering heated surfaces to prevent radiation. These patents, three in number, have been in litigation in Massachusetts, New York and Missouri, where the Federal Courts have sustained them. In the suit in this city, the defendants denied that they had infringed the patents. They became partners in business in September 1882, and about one month later this suit was brought against them. Gould, prior to their partnership, had been in the business of covering boilers and heated surfaces with a plastic non-conducting material. Judge Sahin declares that the case of the Salamander Company, so far as it was in anywise made out, was supported mainly by the testimony of their agent, Millard, Thomas Price and D. W. Johnson. Millard's personal knowledge of the materials used by Hill & Gould, was derived from samples not identified, and certainly shown not to have been made or applied by them. His analysis based on sight and taste, has little value. The testimony of Prof. Price and Prof. Johnston is quite material, and the Judge gives it full consideration. Prof. Price, for example, submitted twelve assays made by him of material given him by the Salamander Company, and presumably made and used by Hill & Gould. The Judge says he finds but two of these assays were of materials shown to have been made or used by Hill & Gould. Of the materials from which the twelfth assay was made, Millard says he saw the defendants applying it. Hill denies this, and so it stands, at least not proven. Prof. Johnston submits nine assays. These may be criticised like those of Price, as they were made from the same samples. Gould, before his partnership with Hill, may have made and used the materials from which all the other assays were made, but this suit is not against Gould; it is against the partnership of Gould & Hill. "If we consider," says Judge Sahin, "all of the twelve assays of Prof. Price, and hold the defendants responsible for the use of the materials, it will still be very doubtful if they have in any manner infringed upon the patents. * * * I cannot think the bill is in any degree supported by the evidence. * * * The testimony of the defendants is full and frank, and the defense is sustained. * * * It is probably true that as non-conductors of heat the one of these appliances may be equivalent to the other, but beyond this there seems to be little similarity between the two substances.

"But were the clay used by the defendants an equivalent in part or in whole for the lime-putty used by complainants, still I do not think the use of the clay would be an infringement. This clay is a natural product. In its use I do not think the defendants added lime in any form. It is not obvious why one may not use a natural product which he finds suitable to his wants and purpose, even though another has a patent for an artificial substance which may answer the same purpose and possibly be a better article. It would seem that the laboratory of nature was for the benefit of all. * * * In this case I do not, from the evidence, think that the defendants have, directly or indirectly, been guilty of any infringement upon any of complainants' patents, and the bill must be dismissed, with costs, and it is so ordered."

Messrs. J. L. Boone and J. J. Scrivner were attorneys for the Salamander Felting Company, and Messrs. John A. Wright and T. E. K. Cormac for Gould & Hill.

MR. CHARLES M. ROLKER'S report on the property of the Colorado Coal and Iron Company, gives the comparative cost of the various processes in Colorado and Pennsylvania as follows:

	Penn.	Col.
To produce a ton of pig iron.....	$19 43	$20 19
To convert pig iron into ingots.....	29 26	33 40
To make steel blooms.....	31 93	38 57
To make steel rails.....	36 41	46 63

The Garland Sewer Trap.

People who live in the city have no more deadly enemy than sewer gas, which steals as silently as death into every house that has a kitchen sink or water closet connection with the street sewer system of the city. If stationary wash basins are found in every room, then every room is in danger of foul and death-dealing, vitiated air, unless fortified by some more than ordinary device for resisting the entrance of obnoxious gases from the sewers.

Notwithstanding the fact that all the waste pipes in the residence of the writer are entirely disconnected from the sewer systems, by discharging into an open hopper outside of the house, it was found that an offensive odor was constantly invading the upper-story rooms. The waste pipes were provided with traps just beneath the wash-basins in the chambers, and traps below near the ground, yet the obnoxious atmosphere prevailed in the chambers.

It was found that the water in the upper traps were invariably siphoned off when the basins were emptied through the waste pipe. This allowed all the foul air arising from the connecting lead pipe, and the adhering waste matter accumulating between the basins and the traps near the ground, to unite in vitiating the atmosphere of the chambers.

A trap, called the "Garland," was applied beneath the wash basins, and found to be efficacious as against siphoning, and effectually prevented all odor from arising from the pipes. An engraving of this Garland trap is given on this page. It is quite simple, as the cut shows, yet is so arranged as to perform its functions automatically and with perfect success. It has a loaded hollow glass ball valve, slightly heavier than water, and two and one-half inches of water trappage. The traps are made of lead, of uniform thickness, and perfectly smooth inside and out.

In the engraving one of these Garland traps is shown applied to a stationary wash-basin. The basin A has the usual overflow pipe B, and basin discharge pipe C. This discharge pipe C is connected with the traps directly as shown. The portion of the water in the trap is shown by the shaded lines in the engraving. F is the loaded glass-ball valve forming a water-tight seal. The outlet E connects with the main water-pipe. H is the trap-screw which is easily removed to recover anything of value lost through the basin sink or other fixture.

When the basin is to be emptied the plug in the bottom is drawn out and the water passes down the pipe C, lifts the ball-valve F and passes out of the water pipe E. When this is done and the flow has ceased the ball valve F drops to its seat again. A portion of the water represented by D remains above the valve F and the portion represented by G remains below the valve.

When the valve F is in its seat, in case any sewer gas should rise through the water pipe E from the sewers, it only forces the valve F more firmly in its seat and cannot pass downward into the water G and up the pipe C into the room. As soon as the outward flow of water ceases, the ball-valve falls gently into its seat again, making it is said a perfect seal against sewer gas. This valve being just heavy enough to sink, acts as no obstacle to the outward flow of anything.

A severe test was made of this trap in the Arcade House. A trap was put in on the fourth story of the building, and connected with pipes in which there were no vents, but it was found on discharging the basin that there was over an inch and a half of water left in the outer chamber of the trap, showing slight siphonage. Then the trap screw was removed, but the valve held the water in place.

Many people suppose that the vent pipes to traps are effective to prevent sewer gas entering, but it must be remembered that with these evaporation of the water in the traps is hastened, and the traps often become empty. Under certain conditions, when these traps are thus emptied, when the room is warmer than the outside atmosphere, the sewer gas will come into the room instead of going out of the vent pipe.

This trap has been on the market for some four years, and people are beginning to recognize its merits, as it has stood the test of experience and time, and the inventor has very numerous recommendations from people who use it. Leading authorities pronounce the trap one of the most important inventions in the plumbing line for many years. There is nothing perishable in any part. It is in use in most of the fine buildings in this city and Oakland, and is recommended by the Board of Health, architects, and the trade generally. From the experience of the writer, the claim of the inventor that the trap is a good preventive of sewer gas is verified. Parties interested in sewer traps should certainly give the Garland trap careful attention.

Charcoal as a Precipitant for Gold.

Some time since we mentioned briefly the fact that Mr. W. Morris Davis had discovered a novel and interesting method of separating gold from its solution by employing charcoal. He found that charcoal has a remarkable energy in causing the precipitation of gold from its chlorine solution, while other metallic and mineral constituents of the same solution are unaffected. The gold is thus both deposited and refined. All that is necessary is to pass the solution of the gold through a charcoal filter, when the gold, in a pure state, is deposited upon the charcoal, which may then be burned and a button of gold readily obtained.

THE GARLAND SEWER TRAP.

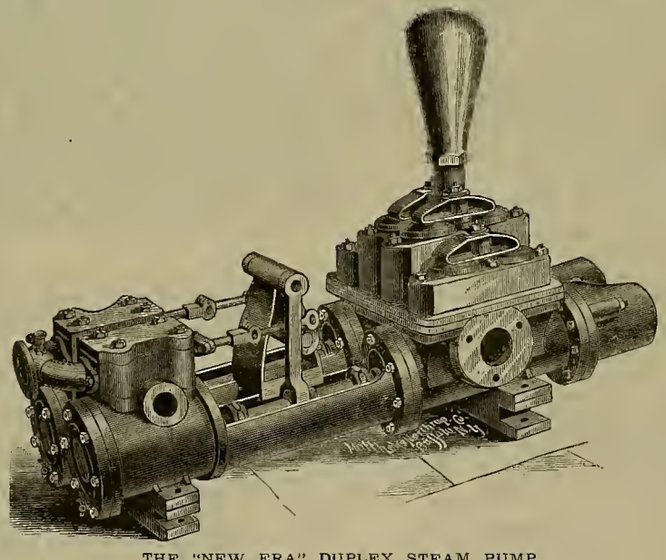
The discovery, so simple in its method, was at first ridiculed by chemists. Repeated experiments have, it is stated, shown its efficacy. Not only are no other substances than gold thus deposited, but the gold itself is stated to be completely separated from its terchloride solution, the liquid, after having passed through the charcoal, containing not even a trace of gold.

As copper is not affected by the passage through the charcoal filter, that metal may be afterwards deposited by contact with scrap iron. Silver would already have been precipitated as chloride in the original solution. By this process, therefore, gold, silver and copper may each be separated by most inexpensive methods from the same solution.

The explanation of the remarkable property of charcoal here described lies in the fact that, as shown by experiment, it has the property of converting chlorine into hydrochloric acid. It oxidizes at the expense of the water, and liberates hydrogen, which unites with the chlorine. It follows, therefore, that the gold is deposited, not from any affinity for carbon, but simply because the chlorine in which it was soluble has been taken away to form hydrochloric acid, in which gold is insoluble. It also follows that copper and other metals soluble in hydrochloric acid are not affected by the conversion.

Another Gold Excitement.

The latest gold excitement is directed toward a point in the Little Rocky mountains about 100 miles east of Benton, Montana. The mines are placer diggings. A number of parties have been organized at Benton to go to the new diggings, and many miners have also gone from Fort Assiniboine, Rock Point and Maiden. From Benton the trip can be made overland, or down the river in mackinaws, the gulch being but a few miles from the river. Gold from the reported mines has been sold at Maiden and Fort Assiniboine, and it was taken out in a few days without sluice-boxes or any facilities for washing. It is claimed that the mines will pay seventy-five dollars a day to the man when properly worked. The discovery gulch is five miles in extent. It is said that the existence of gold in this region has long been known to old Montana miners, and the reported rich finds receives general credence in that territory.



THE "NEW ERA" DUPLEX STEAM PUMP.

A dispatch from Helena, (M. T.) dated the 9th says: "There is great excitement prevailing at Benton over the confirmation of an important gold discovery in the Little Rocky mountains. When the discovery was first reported the citizens of Benton sent a committee, consisting of P. H. Aspling and Dennis Helpin, to investigate. They telegraphed to-day that the mines were good. About 100 claims have been taken up, and those worked pay from $6 to $10 per day to a man working with an ordinary gold pan. In one instance $300 was taken from a pit twenty feet square. Jerry Collins, editor of the Benton River *Press*, telegraphs that half the citizens of that town are either preparing to join the stampede or have already gone.

It is officially announced that cholera has appeared at Bordeaux.

The "New Era" Duplex Pump.

An engraving on this page represents the "New Era" Duplex steam pump. The peculiar valve motion is the prominent and important peculiarity of this pump, as being that to which it owes its complete exemption from noise or concussive action. Two pumps are placed side by side, and so combined as to act reciprocally upon the steam valves of each other. The one piston acts to give steam to the other, after which it finishes its own stroke, and waits for its valve to be acted upon before it can renew its motion. This pause allows all the water valves to seat quietly, and removes everything like harshness of motion. As one or the other of the steam valves must be always open, there can be no dead point. The pump is always ready to start when steam is admitted, and is managed by the simple opening and shutting of the throttle valve.

The peculiar motion of the Duplex allows it to retain a very high rate of speed without noise or hurtful concussion. In single cylinder steam pumps the valve is thrown open at the end of the stroke by a blow upon a tappet, or direct upon the valve. This blow becomes more violent as the speed increases. Their water valves are also dangerously concussive at a high speed, being slammed to their seats by the sudden retreat of the plunger. To make the action of the machine less harsh, the length of the stroke is increased, thus decreasing the number of blows. With the valve motion of the Duplex pump these difficulties are avoided. It has no tappets. It neither strikes a blow nor operates suddenly on the plunger. The piston cushions quietly on steam at the end of the stroke, pauses for an instant until the water valves have closed, and then starts on the return stroke gradually, as the steam valve is opened by the motion of the opposite piston.

The tables arranged by the manufacturers for the purpose of readily comparing the capacity of the Duplex with that of any other single cylinder steam pump, show that the Duplex, being in fact two double-acting pumps, working side by side, has double the capacity of any single cylinder pump of the same diameter of plunger; and that any single cylinder pump must have a plunger twice the area of one of the plungers of the Duplex, in order to equal it in capacity. One of Felthousen's patent oil pumps is sent with each Duplex pump. All pieces are made to gauge and can be readily renewed. Cavanaugh & Fredricks, 317 Mission street., in this city, are managers for the Pacific coast.

AMERICAN MANUFACTURES.—It appears from statistics recently compiled that the whole product of American manufactures in 1850 was valued at $1,019,000,000; in 1860 it was $1,885,000,000; in 1870 it was $4,232,000,000, and in 1880 it was $5,369,000,000. An explanation of the enormous increase in the volume of trade is found partly in the increase of the producing population, but chiefly in the multiplication of machinery. In 1850 there were altogether 957,000 hands employed in manufacture: in 1860 the number was 1,311,000; in 1870, 2,053,000, and in 1880, 2,700,000. The increase from 1850 to 1860 was thus 37 per cent, from 1860 to 1870 about 50 per cent, and from 1870 to 1880 about 31 per cent. The *London Times*, in referring to this enormous increase says: The productive capacity of the United States proceeds at a far greater rate than that of any other country. Half a million persons are added to the population every year from immigration, and these represent a productive element. All are workers, and, indeed, there are few idlers in the States altogether. Another important point is that the machinery represents a producing element exclusively. The great need is to find additional consumers of the products of the enormous industries going forward. The home market has hitherto been chiefly the concern of the manufacturers, but now this market is completely overstocked, and it is necessary to find out foreign buyers. If these be not provided, and the productive capacity of the United States goes on increasing at the present rate, the American people will have labor problems thrown on their hands, which they will find it very difficult to solve.

In the case of the Sutro Tunnel Company vs. The Seg. Belcher, Judge Rising, Saturday, at Virginia City awarded plaintiff $11,920, with 10 per cent interest from February 10, 1882.

The Swinging Axe.

One of the most potent factors in civilization and progress is the "swinging axe." It has ever moved in the van of empire on its westward march. Its great and chief field of labor and progress has been on this continent. The "American axe" is quite distinct and superior as a tool from that implement as found anywhere else on the globe. In fact the American axe is fast supplanting every other make. If an English statesman wishes to show his prowess as an axe-man in felling a tree, he selects an American axe for his implement. It is a very ancient instrument. In studying up the derivation of the word one has to go far back into the pages of the most ancient written languages. It is probably one of the earliest tools invented; but until it found its way into American forests it remained a very clumsy instrument. As now manufactured in this country it has probably attained as near perfection as human ingenuity can reach in the form and constitution of steel and in the mathematical accuracy so important in the shaping and peculiar curving of its handle.

It has been truly said that there is no cleaner, healthier or eujoyable exercise than swinging an axe. In handling one nearly every muscle of the body is brought into active play. It is a whole gymnasium in itself. It will chop out a torpid liver or a dyspeptic stomach far sooner and more effectually than such troubles can be removed by drugs, either olopathic or homeopathic, and it will establish an appetite and digestion which would do credit to a wolf or an ostrich. Perhaps one of its chief advantages arises from the choice it makes of its field of exercise. It must be brought into play where there is plenty of room and good fresh air; and as a healthy body generates a healthy and well balanced brain, so the axe is an indirect promoter of mental and moral vigor.

The workshop of the axe is wide and spacious. It reaches from ocean to ocean and from the gulf to the lakes. Its echoes resound through every mountain valley and are heard from every hill-top. The chopper needs no fire to keep him warm; but his axe often refuses to do duty, when it has been subjected to the influence of a heavy frost until "thawed out" in the presence of a friendly fire.

After leaving the pineries the axe has a long ramble to a new life upon the Pacific slope. In California, on the Coast Range, it enters the famous redwoods, and then indeed another existence is found. In fact, its position in society is elevated. Those noble trees, the Goliaths of the forests, are fast disappearing. But their gigantic stumps still remain to tell of their departed greatness. And enormous stumps they truly are. So much so, indeed, that the axe has to climb in the world to overcome them, and the chopper assumes a position which he is not compelled to take anywhere else. To surmount the enormous swell at the base of the tree and and commence operations where the average diameter of the trunk may be said to begin, he builds a platform made of stakes with cross-pieces of rail, sometimes six or ten feet high, around his victim, and chops from that cutting above the bulbous swell. Or, if an expert, he will simply "bucket" a hole in the trunk, and, driving a stout stake into it, stands perched upon that sleuder foothold as he dextrously swings his blade.

The size of the redwood giants is world-famous and it is a legend of the coast that a woodman having chopped for a week on one side of a tree walked around it and found another chopper who had been at work for a month on the other side. Huge they are but beautiful wood to chop, fairly luring the inquisitive blade to the mysteries of untold centuries wrapped up in their red hearts, and the death-bellow of the forest colossus as, in his final agony, he plunges down some dark wooded canyon, crushing all before him, may be heard reverberating in dull thunder through the cloaked hills at all seasons of the year.

Of the axe in the oaklands of the southwest where it labors for France and Spain, sending them annually thousands of dollars' worth of staves, and also of its desultory existence in cordwood chopping, "grubbing," charcoal stacking, hoop-pole cutting, and kindred industries, little need be said, save that it does its share of the work honestly and has a settled policy that no man shall hold intercourse with it with his coat on. This deference it exacts from all with whom it enters into business relations, whether among the ice-locked lakes and rivers of the white pine, the laurel-scented canyons of the Coast Range, or the magnolia-haunted lagoons of the mournful, moss-draped cypress. There is hardly another physical labor affording the independence of the axe-man. In timbered lands he is always in demand. In the woods there is always room for good choppers, and an axe-man need never be idle from September to April.

A RICH FIND.—Douglas county is excited over a rich find recently made in Red canyon. A prospector brought in a sack of ore to Genoa last Thursday, which contained the richest specimens ever seen in Nevada. Free gold was visible with the naked eye, and it was estimated that the sack of ore would realize $1,000. People are flocking to the canyon and making locations.—*Inyo Independent.*

Saving Flour Gold at Snake River.

The Bellevue *Chronicle* says: The decrease in the depth of Snake river, and in the number of rain-storms along its banks, have given placer miners a chance to get to work, in some cases with remarkably large results, says the Shoshone *Journal*, while from all the districts increased activity as compared with last year is reported. At Bonanza bar the Holyoke Company is about finishing up the bar tbey have worked for the last few years. This compauy is also operating the Shoshone har, and, further down, the Castle Creek, and have been paying a monthly dividend of 3 per cent on a capital of $150,000. The Boston company is making preparations for the biggest run of the season. Clark's concentrator, for saving the black sand, instead of returning it to its native Snake, is not quite finished yet, but great results are expected from its operations elsewhere. The Midas Company has two steam mills on its claims. The upper one started in on the 7th inst. on a small 8-inch centrifugal pump, which supplies the ground sluice with about 100 inches of water, and after a few hours run reported 2,000 pounds of sand on the burlaps, worth from $25 to $30, estimated from the rate per ton which this dirt carries, as ascertained from previous workings of the bar. The Hamburg unexpectedly struck three springs of water flowing from the lava rock, forming the walls of the canyon. This pleasant surprise is being utilized hy digging a ditch which will unite the three into one, giving togctber about twenty inches of water, and relieving the company from the necessity of pumping water from the river, as was its first intention. The ditching and the building of the mining machinery will be completed about the 20th of August, when the work of saving the gold will be inaugurated, under the superintendence of Mr. James Gifford. A small run lasting about two hours, with two men, on an experimental machine, and using the water from one of the springs, resulted in a "dab" of amalgam weighing six ounces—a pretty fair augury for the pecuniary success of the enterprise. The Idaho Placer and Improvement Company, Judge L. K. Adams, manager, has one of Job Smith's water motors in successful operation on the Excelsior claims, and although the water has been so far applied to irrigating purposes, the applicability of the machine to raising water to any desired hight for mining purposes gives the motor a place in a mining article. The bar of the Excelsior is not above the average, but is expected to yield from $5 to $7 per ton of concentrates, when the sluice hoxes are finished and the amalgamated plates put in position. It is at this point that the Vulcan company runs a ferry in connection with its mining plant. Water is to be furnished through a centrifugal pump run by steam power, but operations have not begun there yet.

Lead Works in Utah.

A visit to Franklyn is interesting because of the busy scene one is urshered into. The Horn Silver, with its 170 men, is handling about 140 tons of ore per day and turning out about four car-loads of bullion, which aggregates $12,000 every 24 hours. This great property is so well known to our readers that it is needlses to enter into any description of tbe works. Connected as it is with the railway by various sidetracks, ore, fluxes and fuel are handled with as little manual labor as possible, and yet we find this small army of men always busy, and with plenty of work to do. The dump pile is being raised some three or four feet, thus giving a very large dumpage on top of the old slag pile.

The Germania.

At the Germania we found only one furnace at work, the other two heing idle for repairs. Eighty or ninety men are employed about the works when in full operatiou. At present fifty tons of ore are reduced per day. At the time of our visit they were eugaged on Crescent ore, and mixing in roasted ore and ore from the Juab Lawrence mine in Little Cottonwood. The refinery part of the works was also closed for repairs, but bullion was being hauled, ready for refining when the furnaces are heated up again in a day or two. An immense pile of refined lead is piled up ready for shipment, but the company is not anxious to dispose of this until there is a rise in the market. The white lead works were in full hlast with most of the machinery. The product of white lead per day is about 10,000 pounds. This is put up in various shapes, such as dry paint, and mixed in oil, then packed in kegs of 12½, 25, 50 and 100 pounds each. The company manufacture their own pyroligneus acid for oxidizing the lead, after it has been made into minute granules by the action of steam jets while in a molten condition. Red lead and litharge are also manufactured, this part of the business being conducted in a separate building, having a capacity of 6,000 pounds per day, making the entire consumption of refined lead average about 16,000 pounds per day. The works employ forty men, and everything appears to be in first-class order. There is, also, an excellent pipe-plant, capable of turning out a car-load of lead pipe in a day, and this is run often enough to supply the demands, which are all the time on the increase.

This lead industry promises to become a very important one for this locality, and we hope its success will lead to the establishment in this valley of many new manufacturing enterprises.—*Salt Lake Tribune.*

Tailings Worked Profitably.

It is generally conceded that by the most improved milling machinery now in use for the treatment of gold ores, at least from 25 to 30 per cent of the gold is lost in the tailings. The idea that the principal loss is involved in the escape of a large percentage of sulphurets is incorrect. As a matter of fact the sulphuret-saving machinery works closer than the machinery for catching the free gold. It has been ascertained that the chief loss is in the exceedingly fine particles of gold—so light on account of their exceeding fineness that they escape amalgamation by either floating on top of the agitated water or else become mixed with the slime from which it has been found impossible to separate them. While at Amador City the other day, our attention was drawn to some extensive carpenter work in process of construction below the Keystone mill. On inquiry, we learned that the works intended to catch the free gold contained in the tailings by a process never before tried on this coast. The method is patented by Messrs. Morris and Clements, who were personally superintending the constructions of the works of the Keystone. Whilst the plan is new to this country, it has, we are informed, been practically tested for years in South American mines with gratifying results. There it has passed beyond the experimental stage, and has taken its place as an ackuowledged gold-saving contrivance. The tailings are first run into a large tank. Below this is a large hoarded surface, having a slight fall. Slats are nailed over this at a distance of about a foot apart, thereby forming twenty shallow sluice-boxes. Over these strips of of blankets are laid, covering the entire surface. The tailings are then run over these blankets, and, covering such an extended area the stream is necessarily very thin and the current slow. The idea is that gold-freighted slime adheres to the blankets, while the lighter and worthless material runs off. A man is kept steadily at work washing these strips of blankets in a tank of water kept for that purpose, going through the entire lot every hour or so. In this way a considerable percentage of the fine gold contained in the slime is concentrated in the tank. By what process the gold is afterward separated from the slime, we are not permitted to state. This is probably the great secret of the husiness. The process seems feasible enough. We understand that the inventors are under engagement to put up similar works at the Plymouth mines as soon as they get through at tbe Keystone. The plan is reported a success in other countries, and the presumption is that it will prove so here.—*Amador Ledger.*

DEMORALIZED SALT WORKS, ETC.—D. B. Lyman, Superintendent of the Sierra Nevada and Utah mines, has just returned from a trip of inspection to the Eagle Salt Works, out on the line of the Central Pacific, toward White Plains. The Eagle Salt Works are now owned by the bonanza firm. Mr. Lymau says it has been a bad season for making salt. Before the heavy rains set in there was in the evaporating reservoirs a stratum of good salt, amounting to several hundred tons. The rains deposited upon this a stratum of sand and upon this was deposited another stratum of salt, and so on—a stratum of sand marking the wet and a stratum of salt the dry weather. It is a very pretty stratification, but the trouble is that the salt cannot he separated from the sand without re-dissolving the former. Mr. Lyman reports the White Plains artesian well down over 2,100 feet, with hard rock at the bottom. He brought in some curiosities in the shape of geodes, picked up out on the desert. One of these, about the size of a black walnut, is a perfect imitation of a death's-head. There are black cavities representing the eyes and the nose, while the remainder is of a dirty white color.—*Virginia Enterprise.*

RECEIPTS OF COAL IN AUGUST.—The receipts of coal at San Francisco last month were larger than for any previous month this year, and the total was nearly 18,000 tons in excess of July. The quantity was proportionately distributed among the several sources of supply. Exclusive of the product of the Mount Diablo mines, the deliveries for August and for the first eight months of the year have been as follows:

	For August.	Jan. 1 to Aug. 31.
Carbon Hill	16,890	101,015
Renton	2,066	28,202
Seattle	15,345	87,459
Coos Bay	1,800	16,109
Anthracite	1,458	9,805
Cumberland	3,000	15,907
East Wellington	1,600	10,403
Nanaimo	9,796	64,244
Wellington	7,030	73,686
Australian	12,688	74,574
English	6,823	35,853
Welsh	2,401	12,814
Scotch	2,375	11,356
Totals	83,272	540,927

Gold and Silver in San Francisco.

In the vaults of the sub-treasury in this city there are eighty-three millions of dollars. Assistant Treasurer Nathan W. Spaulding, who controls the sub-treasury here, has occupied that position for three years, during which time the amount in the treasury has iucreased from about $27,000,000 to some $83,000,000. Mr. Whelpley, Cashier of the Treasury Department at Washington, and Mr. Smith arrived on the 26th of July, and at once began counting the money in the vaults and making a thorough inspection of the books. Thirteen assistants, engaged in this city, were employed, and the inspection was concluded on the 28th ult. The inspectors remarked that the sub-treasury in San Francisco was the second in magnitude and importance in the United States, and complimented Mr. Spaulding highly on the methods and business of the office. They had failed to find a discrepancy of one cent in $83,000,000! The books of the office were also found in admirable order.

Very little of the working of the United States Treasury is known to the general public, although the office is run to accommodate the people, and the daily exchange in money averages some $20,000. Of the amount of money in the treasury, not counting decimals, $51,500,000 is in gold, which weighs 85¾ tons; $26,000,000 in silver, which weighs 715 tons, and $5,000,000, in round numbers, in paper. It would appear at first sight that thirteen people would take much longer than a month to count this immense sum of money, but it is counted by weight. The gold is all kept in sacks of $20,000, and the silver in sacks of $1,000. These can be quickly weighed and thus the amount in the treasury easily determined.

All the business for the federal government west of the Rocky mountains, from Alaska to Mexico, is transacted through the office in San Francisco. The money taken in and paid out amounts to over $6,000,000 a month. This comes from or goes to the Custom House, Internal Revenue Department, Post-office, Laud Office, etc. Money is paid out to all the federal offices, courts, army and navy, Indian agents, government contracts, mail carrying, coustruction, etc. Great stress has sometimes heen laid upon the fact that so large an amouut of money is allowed to lie idle. Not much does so, as by far the greater part is in circulation through gold and silver certificates.

Concentrating Ore in Utah.

The Salt Lake *Tribune* says: The Crescent Company sent in 3 lots of ore, valued at $10,450. The concentrating mill at the Crescent, planned in its methods and machinery by Mr. B. B. Van Deusen, will embody all that has been recently learned respecting the concentration of lead ore. Rolls will be used for crushing, thus avoiding pulverizing the lead more than is necessary, which makes a slum of it, exceedingly difficult to handle. The secret, Mr. Van Deusen says, lies in sizing. The ore will be delivered automatically into revolving sizing screens, set one below the other, five or six of them, the different sizes save the slums going then to jigs. The slums will go to Ritteuger tables or similar tables; and it is believed that 90 per cent of the lead can in this way be saved. The loss in silver will depend on the amount of silver in the quartz, which will all be dressed out, and in the form of chloride. Mr. Van Deusen does not approve of stamps for carbonate ores, because, as said before, it transforms the lead into a slum, which is the worst condition to put it in for concentrating. But for lead ores mixed with iron pyrites, the stamps, as at the Spanish mine, may work well. Austin Bemis and his associates, at the Spanish mine, succeed in dressing out the pyrites of iron, as when broken to the same size as the galena the two separate readily, by reason of their different gravity. This mill (5 stamps) has been used more or less for some years, but the improvements in the art have only been added lately. It will soon start up for business, and is expected to successfully dress the pyrites lead ores of Bingham. By all accounts Mr. Michener's mill (the old Great Basin of Gen. Conner) at Stockton has got the trick of concentrating low-grade lead ores to perfection, and all the implements to do it with. The ore bodies are said to be stronger than ever in the lowest openings of the mine. Mr. Michener might earn dividends with this property, but the low price of lead is inducing him to hold back shipments. The failure of lead to re-act these days is the dark spot in the sky of Utah lead silver mines.

THE Tombstone Mill & Mining Company has mined and treated during its existence $9,608.39 tons of ore, yielding an average of 35,991 ounces silver, and 0.105 ounce of gold per ton. Mining last year cost $14.31 per ton; milling, $5.62; concentrating, $1.57; smelting, $18.90; sundries and administration, $1.77. The ore product last year was 17,520 tons. The mines have produced bullion in two years valued at $1,375,237.26, yet its bonded debt is only $106,000 less than it was when dividends ceased. The compauy joined the movement to reduce wages from $4 to $3 a day, and are now idle on account of the deadlock this brought about.

Assessment Work.

"The Law about Annual Labor on Claims."

Great misunderstanding prevails respecting the law of annual labor and of relocation lodes. Hon. Thomas B. Bryan, a prominent attorney of Chicago, says in the *Mining Review* that although section 2324 of the United States Statutes requires at least $100 worth of work to be done on each lode within each year after that of the original discovery, and until the lode is patented, or what is equivalent, a Receiver's Receipt is issued, the neglect to do that required for any one or more years, unless there is intentional abandonment of the claim does not actually forfeit the title. To work such forfeiture there must not only be neglect, but there must also be a legal relocation, before resumption of work by the owner, the neglect and such valid relocation combined operating to complete the forfeiture. The $100 worth of work must be done entirely within each calender year, between January 1st and January 1st, and if $99 dollars worth of work be done in 1884 and $1 in 1885, the work for 1884 is not complete, nor is that of 1885, until a full $100 of work shall be finished in 1885, a fraction of the $100 of work done in any one year not applying or cutting any figure as to work for any other year. If the owner neglects in whole or in part his annual labor for 1884, or for several years, he still has the first claim to the lode as long as another has not relocated it, for if no one has taken advantage of the claim being open to relocation the owner may resume work on January 1, 1885, or at any time thereafter, in advance of such relocation, and from the moment of such resumption of work in good faith, past neglect is forgiven, and the negligent owner's title is cured of its defect. If, however, a relocator should commence work on January 1, 1885, or at any time thereafter before such resumption of work by the negligent claimant, and should conform strictly to the requirements of the law in regard to relocation, the relocator's title is perfected, and the previous owner's claim is forfeited. The question is often asked, What amount of work must be done by the original owner after neglect of a previous year's work, to entitle him to hold the claim? Must he not only resume work, but also continue it uninterruptedly till the $100 worth of work is completed, or if he should also resume work, and then suspend it, can another party during this suspension, and before the $100 worth of work is completed, enter on the lode and make a valid relocation? A great diversity of opinion has been entertained on this question, the best mining lawyers holding that the resumption in good faith is sufficient, and that it entitles the party so resuming to continue and complete his $100 worth of work during that calendar year up to and including December 31st. The last case of this kind noted in the books was reported November, 1882, in 62 California 160, where a mine owner neglected his annual work for one year, then resumed work the following year, but after doing about $12 of work upon each lode in January suspended work. Another party entered and attempted to relocate in August. The Supreme Court of California decided such relocation to be illegal, and that the original owner could have completed his work any time during that year. "The work done was actual and valuable. The letter of the statute upholds the view as to resumption of work, taken by the Court below, and forfeitures and denouncements are not to be favored by basing them upon language which does not plainly and unmistakably provide for them." The law may, therefore, be considered definitely settled in the direction indicated.

BULLIONVILLE.—The work preparatory to the commencement of working their tailings by the new process is now being pushed ahead by the smelting company. Men are now engaged in removing the concentrating tables from out of the mill building and clearing away everything and making ready for the erection of the new machinery required. The tailings will be roasted prior to leaching. Mr. W. S. Godbe has gone to San Francisco for new pans and such other machinery as shall be required. The company expect to realize a handsome profit, as the tailings are all their own, and the various tests made of the tailings in the East exhibit between $15 and $16 in silver. Work is being pushed so as to have the machinery in place and running as early as possible.—*Piorhe Record.*

C. C. STETEFELDT writes the *Engineering and Mining Journal*, combating the notion that fine crushing is essential for good roasting in a Stetefeldt furnace. He gives the result of some trials by Mr. Russell at the Ontario. With a No. 30 screen on the battery, 20 stamps crushed 34 tons in 24 hours, and Russell's process extracted 96.2 per cent of the silver. With a No. 20 screen, 55 tons were crushed in the same time, and 97 per cent of the silver extracted. With a No. 16 screen, 65 tons were crushed in the same time, and 97.2 of the silver extracted. The ore was roasted with 12½ per cent of salt in a Stetefeldt furnace.

LIVELY TIMES AT MARIETTA.—John Bell, of the Mount Cory mill, will leave to take charge of the mill at Marietta, which will start up on the 1st on ore from the Endowment mine. There are about 700 tons of ore on the dump and a long and successful run is predicted. It is said by those who are in a position to know, that lively times are in store for the old camp.—*Walker Lake Bulletin.*

USEFUL INFORMATION.

Colored Varnishes for Tin.

A German paper gives the following process: Thirty grammes of acetate of copper are ground to a fine powder in a mortar, then spread out in a thin layer on a porcelain plate and left for a few days in a moderately warm place. By this time the water of crystallization and most of the acetic acid will have escaped. The light brown powder that is left is triturated with some oil of turpentine in a mortar and then stirred into 100 grammes of fine fatty copal varnish to 60 R. (16.7° Fahr.). If the acetate of copper was exceedingly fine, the greater part of it will dissolve by a quarter hour's stirring. The varnish is then put in a glass bottle and placed for a few days in a warm place, shaking frequently. The small quantity of acetate of copper that settles can be used in making the next lot.

This varnish is dark green, but when applied to tin it requires four or five coats to get a fine green luster; but two coats are sufficient, if it is heated in a drying closet or on a uniformly heated plate, to produce a great variety of shades of gold. A greenish gold, a yellow or dark yellow gold, then an orange, and finally a reddish brown shade is obtained, according to the time and temperature. The colors are superior in brilliancy to those obtained with the English gold varnish, and have the advantage of permanency in the light. If a good copal varnish is used in making the polychromatic varnish, or lac, the tin can be hammered or pressed.

The production of golden colors depends on the reduction of cupric oxide to cuprous oxide (protoxide to suboxide), which, in small quantity, dissolves in the copal varnish with a golden color. The more the heat the greater the reduction, and hence the darker the color. Success depends on applying it evenly and warming uniformly.

TO RENDER HORN TRANSPARENT.—The imitation of tortoise shell with horn is as follows: Mix up an equal quantity of quick lime and red lead with soap lees; lay it on the horn with a small brush in imitation of the mottle of the tortoise shell; when it is dry, repeat it two or three times, or grind one ounce of litharge and half an ounce of quick lime together with a sufficient quantity of liquid salts of tartar to make it of the consistence of paint. Put it on the horn with a brush in imitation of tortoise shell, and in three or four hours it will have produced the desired effect. It may then be washed off with clean water; if not deep enough, it may be repeated. The original preparation consists in roasting the horn over a fire made of the stalks of furze; when rendered soft it is slit on one side and kept expanded flat between a pair of tongs; it is then placed between iron plates, which are greased. The horns are suffered to remain until they are cooled; they are then soaked in water enough to be pared down to the required thinness with a large knife worked horizontally on a block. Their transparency is thus acquired, and after being immersed in lye, they are polished with whiting and the coal of burnt willow.

HOW TO GREASE A WHEEL.—A well-made wheel will endure constant wear from ten to twenty-five years, if care is taken to use the right kind and proper amount of grease; but if this matter is not attended to, it will be used up in five or six years. Lard should never be used on a wagon, for it will penetrate the hub, and work its way out around the tenons of the spokes, thus spoiling the wheel. Tallow is the best lubricator for wooden axle-trees, and castor oil for iron hubs, but many of the patent axle greases are also excellent, and have the merit of being cheaper and more convenient to handle. Just grease enough should be applied to the spindle of a wagon to give it a slight coating. This is better than more, for the surplus put on will work out at the ends, and be forced by the shoulder-bands and nut-washer into the hub around the outside of the boxes. To oil an iron axle, first wipe the spindle clean, wetting with spirits of turpentine for that purpose, and then apply a few drops of castor oil near the shoulder and end. One teaspoonful is sufficient for the whole.

WELL TANNED LEATHER.—The New Hampshire Pulp and Paper Company, Bristol, N. H., while making excavations for the foundation of some new buildings at a depth of 16 feet, came upon a vat containing thirty-six sides of leather perfectly tanned and in as good state of preservation as though given the ordinary time. The liquor was pure and sparkling. On investigation it was found that a tannery was owned by Gov. Berry and burned on this site about 1832, and by some mischance this vat of hides was neither burned nor recovered. The leather is now being finished at the tannery of E. K. Pray, and when done will undoubtedly be some of the best tanned leather in America.

TO PRESERVE POSTS.—A correspondent of a contemporary says: "I discovered, many years ago, that wood could be made to last longer than iron in the ground, but thought the process so simple that it was not well to make a stir about it. Posts of any wood can be prepared for less than two cents apiece. This is the recipe: Take boiled linseed-oil and stir in pulverized coal to the consistency of paint. Put a coat of this over the timber, and there is not a man that will live to see it rot."

LONDON AND NEW YORK.—Manhattan Island is already like London—"a province covered with houses"—but its population is far more concentrated. While London has but 170,000 persons to the square mile in its most densely-settled districts, New York has 290,000. London has seven inhabitants per house, but New York has twenty-five. In London there is an average of forty-nine people to an acre. In New York there are in certain sections from 300 to to 750 persons to the acre. London with less than 4,000,000 people, covers 75,632 acres; New York, with about one-third of the same population, is confined to 12,570 acres, or one-sixth the area. The English metropolis has 486,236 houses, New York has less than 103,000.

TUNGSTATE OF SODA, according to the *Textile Record*, is about the most serviceable substance yet made use of for rendering fabrics fire-proof. In the most effective process for the accomplishment of this object, the material is dissolved in five times its weight of lukewarm water, and, on the solution being mixed with a very small portion of phosphate of soda, it is then ready to be used for saturating tissues. After being thoroughly steeped in this, the goods are wrung out and dried at a moderate heat, and may then be ironed and treated in the usual manner. They are thus made capable of resisting the action of heat for a long time, and, if ignited, they merely smoulder without bursting into flame.

MINERAL WOOL is used for a packing to deaden the sound between floors in buildings, and, being incombustible, it is now pretty generally used between the floors and ceilings in new houses. Mineral wool is obtained from the slag from blast furnaces, and is produced by throwing a jet of steam against the stream of slag as it flows from the furnace.

BOILED LETTUCE makes a good salad and furnishes an excellent substitute for spinach. It is said to possess soporific properties, and not to contain the quantity of oxalates to be found in spinach, rhubarb, sorrel and some other vegetable products used for salads.

SCRAP FORGINGS, made of best selected material, are better for shafts than the best cast iron, which has its place only where slow-running shafts, without jar, can be used.

Boots and shoes, it is said, may be rendered water-proof by soaking them for several hours in thick soapy water.

GOOD HEALTH.

The Growth of Brain Power.

The question now arises, says a writer in the *Phrenological Journal*, in speaking of the growth of brain power: Where in the series of events is there room for any fresh element to come in? Can any man ever be anything other than what some of his ancestors have been before him? And, if not, how is progress or mental improvement possible? That men have, as a matter of fact, risen from a lower to a higher intellectual position is patent. That some races have out-stripped other races is equally clear. And that some individual men have surpassed their fellows of the same race and time is also obvious. How are we to account for these facts without admitting that new elements do at sundry times creep in by chance, in the false and unphilosophical sense of the word? How can we yet advance unless we admit that exceptional children may be born from time to time with brains of exceptional functional value, wholly uncaused by antecedents in any way?

The answer to this question is really one of the most important in the whole history of mankind. For, on the solution of the apparent paradox thus propounded depend two or three most fundamental questions. It is by this means alone that we can account, first, for the existence of great races like the Greeks or the Jews. It is by this means alone that we can account, secondly, for genius in individuals. And it is by this means alone that we can account, thirdly, for the possibility of general progress in the race. It is surprising, therefore, that the question has so little engaged the attention of evolutionary psychologists at the present day. There are only two conceivable ways in which any increment of brain power can ever have arisen in any individual. The one is the Darwinian way, by "spontaneous variation"—that is to say, by variations due to minute physical circumstances affecting the individual in the germ. The other is the Spencerian way, by functional increment—that is to say, by the effect of increased use and constant exposure to varying circumstances during conscious life. I venture to think that the first way, if we look it clearly in the face, will be seen to be practically unthinkable, and that we have therefore no alternative but to accept the second.

INSANITY IN FRANCE.—One of the most striking features of modern French life is the rapid increase of insanity, the number of cases of which, and especially those induced by alcoholism, is becoming larger each year. In 1882 there were 13,434 admissions into the asylums, of which 10,181 were new cases, the total number under treatment in the year being 58,760, of which 27,000 were men and 31,000 women, showing that females are the most liable to the disease. That they are less influenced by treatment is shown by the fact that the average duration of treatment for men is 276 days, while for women it is 295 days. In France there are 61 public and 42 private asylums, of which 9 are for men only, and 14 for women only, the remainder being for both sexes.

Poisonous Coffee.

Who would have surposed that the coffee berry could be tampered with? Very few persons we opine; but it seems that Dr. Walker of the New York Board of Health has been examining several brands of coffee that have been put through a sort of polishing process to make the coffee look better and therefore more salable. In this process a sack of coffee is placed in a horizontal revolving cylinder, and certain substances added which have the effect of polishing and coloring the berries. Some of these coloring matters are the most violent of poisons. Here is the result of the Doctor's analysis of specimens of Guatemala and Mericalbo coffees: Among the coloring matter used is chromate of lead Prussian blue or perrocyanide of potassium, yellow ochre (in which arsenic is often found), amber, Venetian red, lamp-black, gum-arabic, soapstone and charcoal. About one-sixtieth part of a grain of arsenious acid is found in every cup of coffee made from the colored bean.

Dr. E. F. Bartley, chemist, has also made similar examinations and reports that French chalk, gum-arabic, charcoal from wood, burnt bones, yellow ochre, Venetian reds, chrome orange, celestial blue, indigo, indigo extract and other chemicals were used in the coloring process. The use of chrome orange (sulphate of lead) and celestial blue he recommended be discontinued at once. Prof. Martin agreed that the use of chrome orange and Prussian blue should be discontinued, as they are dangerous to health. The companies were directed to discontinue the use of the poisonous drugs.

A large mill establishment for thus doctoring coffee has been established, where whole cargoes are sent by different importers to be treated. Persons who purchase coffee in the bean should refuse to buy any except it be in its natural state. Nothing of that kind can be done to make the beverage any more pleasant to the taste or more healthy to drink. We are not aware that any such objectionable processes are carried on in San Francisco. Our coffee is imported direct and sold in the original package and not tampered with at all.

POISONOUS FISH.—Fish are sometimes in a condition liable to poison the eater—such the conger eel, mussels, crabs, etc. When any poisonous effects appear from such causes, remove as soon as possible the contents of the stomach and bowels by emetics and castor oil. Ground mustard, mixed with warm water, is about as good and as ready an emetic as can generally be found in the house. Castor oil should also be given at once to move the bowels. Ether with a few drops of laudanum, mixed with sugar and water, may afterwards be taken to advantage.

THE POISON OF SERPENTS.—When a person has been bitten by a poisonous serpent, a ligature or handkerchief should be applied moderately tight about the bite, and a cupping-glass, if obtainable, should be placed over the wound, or any practicable means used to remove the poison from the same. The person should also drink freely of any kind of alcoholic stimulant. A small quantity of ammonia should also be given either in the liquor or otherwise. A physician, if present, would probably, in addition to the above, inject ammonia under the skin.

POISONOUS INSECTS.—In case of stings from scorpions, spiders, wasps, bees, etc., moisten a rag with a solution of carbolic acid, or what is probably better, salycilate of soda, and bind it over the bite or sting until the pain is relieved. A few drops of the acid or salycilate in water may also be given internally. The sting of a bee or wasp which is always left in the wound, may generally be removed by making a strong pressure around it with the barrel of a watch key.

VACCINATION performed once does not act as a preventive of small-pox after a certain length of time has elapsed. An examination of the statistics of this disease shows that of those who had taken it and had been vaccinated in infancy, 90 per cent are over 10 years of age, while only 10 per cent are under 10 years of age. Re-vaccination at intervals, say of 7 years, is the only known effective measure for protection.

FOR THE TOOTHACHE.—The Chicago *Industrial News* gives the followiog, by authority, as an instantaneous cure for toothache: Take a small piece of zinc and a bit of silver (any silver coin will do), place the zinc on one side of the afflicted gum and the silver on the other; by bringing the edges together the small current of electricity generated immediately and painlessly, stops the ache.

ACOUSTIC CANES are a French invention for the benefit of persons afflicted with imperfect hearing.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

BUNKER HILL.—Amador *Ledger*, Sept. 6: The Bunker Hill mill has been fitted with boiler and engine, so that hereafter, when the water supply is cut off from any cause, they can run the mill by steam. There is always enough water to be had for the batteries.

THE MEDIAN mine is again in operation. Work was suspended for only one day, owing to the slight misunderstanding among the parties interested. A New York company has secured an interest in the property, and they are bearing the expense of the present work. It is the intention to open up the mine in a thoroughly systematic manner. The shaft will be put down to a considerable depth, and levels opened at every 100 ft. Ten or twelve men constitute the present working force, but it will be largely increased when the point for drifting is reached, as it is intended to sink and drift at the same time.

THE WATER at the Gover has been reduced to the 600-ft level. It is the intention of the present management to explore in the 400-ft level for the ore-body. At this point some very rich rock was extracted, and it is confidently believed that a little drifting will result in the discovery of further pay-ore. The mill was to have been started almost immediately, but it is found that water for that purpose cannot be had until winter.

AT THE SEATON things move along slowly. The new pump put in to control the water, had to be taken out. It worked very unsatisfactorily, and was continually breaking. They are now controlling the water by bailing It is contemplated to start up the Mammoth 10-stamp mill shortly to put through the the rock already out, which will take about two months. After that it is probable that the mill will be torn down and removed to the Lighthouse mine.

Colusa.

COAL.—Colusa *Sun*, Sept. 6: We have seen specimens of coal from the mine being opened by E. S. Ashley, west of Maxwell. The coal is very fine, and we are told that the propects for a large mine are very flattering, indeed. This will be a grand discovery for Colusa county, and for the immediate vicinity, if it does turn out well. This land has all been purchased of the government, and the coal goes with the land. Hence, the owners of the land will have a good thing, and will not be bothered getting title under any mining laws. As Mr. Ashley has been very active in opening the mine, we hope it is on his land, or that he has an understanding with the owner.

Fresno.

COARSE GOLD GULCH.—Fresno *Democrat*, Sept. 5: The mineral belt through Fresno county varies in width, being from 3 to 5 miles wide, and is of different formations. On the west side it is of pure slate, being about 300 ft wide. The next towards the east is a metallic slate and serpentine formation mixed, having some deposits of asbestos. In it there are some indications of copper and some coarse gold. The next is a talc formation, with several large sikes running through it, and three or four gold-bearing ledges in it which carry coarse gold. The main placers in early days were on the gulches which headed against this belt. The gold is of good quality, $19 per ounce, and right coarse. The largest that was ever found was picked up near Coarse Gold gulch, on what is known as Deadwood gulch. It coined $707. The next belt is on Potter Ridge. It is very pure slate—soft, with large ledges of iron rock running through it, which are good indications of rich deposits. If any one can find a cross ledge, or a spur, or where two ledges come in contact, he will strike it rich. It never fails in this kind of formation, and the gold is very pure. The Enterprise mine is on this formation. The company is running in a level from the mill which will tap the ledge 2,000 ft deep. They are running the Burleigh drill, and have five men at work. The Hawkeye mine is in the same belt. It has kept a 5-stamp mill running for a year, part of the time day and night. Being scarce of water, they only run during the day now. They are down on the ledge 200 ft, and it is rich, and the gold is free yet at that depth and in soft formation in the bottom. The same company, Messrs. Long & McLaren, discovered a ledge about 400 yards south of their mill about six weeks ago. They have got out about 200 tons of rich ore, and are down 40 ft. The ledge is 3 ft wide, and the prospects now are favorable for a splendid mine. This new discovery is in the Deadwood gulch. John Haley is putting up a mill on the Gambetta mine. They have there about 800 tons of very rich ore. The McDonald mine is running along very steadily. They have a 5-stamp mill. The Texas Flat is running, and has been all summer. They also have a 5-stamp mill. The Last Chance is delayed part of the time on account of not having water enough to run the mill, which is a 10-stamp. The Quartz Mountain is on a boom. They have about 100 white men, miners and carpenters, and a number of Chinamen, at work on their ditch.

Humboldt.

NEW RIVER.—Trinity *Journal*, Sept. 6: From James Mullane, of Big Bar, we learn that latest reports from the quartz discoveries on New River are most encouraging. Smith B. Brooks' partners have prospected the mine he discovered sufficiently to guarantee the success of a mill, and they have gone to San Francisco to order one and get it in as soon as they can. Clifford & Co. have found their rich ledge to be much better defined and larger as they get down on it. Other mines in the district are reported as prosperous.

Inyo.

ETNA FURNACE.—Inyo *Independent*, Sept. 6: A very important addition has been made to the works at the Etna furnace; this is the erection of a refinery, now almost completed. Hitherto the bullion was all shipped to San Francisco, thus adding largely to the expense for freight, and taking away lead that was needed to mix with ore in the furnace. Now the lead will be extracted at home, and will help largely to increase the amount of ore that may be worked. The full capacity of the furnace is 30 tons per day, and it will soon be working that quantity. The company can easily supply the furnace fully from their own mine.

DEEP SPRINGS.—Mr. P. A. Chalfant, who came in a day or two since, from the Greenly mill, Deep Spring district, informs us that the principal object of his visit here now is to procure additional machinery and appliances for saving the gold at the Greenly mill in which he is interested and has been running since it was first started up in June last. Up to the present the mill has been running with no other means of saving the gold than a full set of silvered plates. Not over 60 per cent of the gold can be saved by plates alone, and now, as above intimated, a concentrating machine and other appliances are to be added immediately. The mill has work enough ahead of it to keep it constantly employed for months to come, even from one mine alone, the "78," which in recent developments, shows up grandly, both in quality as well as quantity of its ores. The lead is fully 30 inches thick in most places in two different drifts, never less than 12 inches anywhere, and all pay ore. Three miles below on the same creek, Sam. Piper and Mr. Simonton have just completed and started a fine 12-foot arastra for the reduction of some very rich ore from mines belonging to the first named, situated two or three miles north of arastra, but in Mono county. At Pigeon Springs, Palmetto district, Stevens & Co., are constructing, and will soon have in operation, two 12-foot steam arastras, and it is stated have an abundance of good $40 ore to keep them supplied for an indefinite period. The little silver mill at Lida, still further eastward, belonging to P. Keizer & Co., is making money right along. In Deep Spring valley proper, at Antelope springs, some work is being done all the time toward completeing the McMurry furnace—an enterprise that has the best wishes of every one in that region, for once in successful operation it would "boom" that country wonderfully. S. P. Roberts, at Pine Mountain, some ten miles distant from this furnace, is busy taking out galena ores for shipment to San Francisco. Mr. Roberts is confident he could, from his mines alone, keep this furnace supplied almost if not quite to its capacity taking galena and carbonate ores together. The latter is more abundant than the former, but not rich enough to give any profit to ship to the bay, though quite enough so for local reduction. There are quite a number of other locations in Pine Mountain equally as good perhaps as those being worked by Mr. Roberts, but nothing beyond assessment work is or likely will be done upon them under existing conditions.

Mariposa.

NEW MILL.—Mariposa *Gazette*, Sept. 6: Wm. R. Knight and Daniel Knight, carpenters and millwrights have just completed the 8-stamp quartz mill, run by steam power, on Sweet Water, belonging to James Ferguson and Rice, which is said to be the most complete outfit of a quartz mill ever put up in the country. The mill, which was to have started up last Thursday, lies contiguous to several good veins, either of which contains good ore, and particularly that of the Early vein, which will be worked first.

BANDERITA.—*Herald*, Sept. 5: We are informed that the work of development is still progressing at the Banderita mine, above Coulterville, under the efficient direction of Superintendent Mast, and that gold can be shown every day.

Mono.

THE GREAT SIERRA.—Homer *Mining Index*, Sept. 6: To set at rest the many absurd stories now in circulation regarding the starting of work in the Great Sierra tunnel, Tioga district, we may state that the repairs to the wagon road were completed on Thursday last; that some of the Eastern owners are expected to leave the Atlantic sea-board next week, and to arrive at Bennettville from the 10th to the 15th of September; that they will probably remain there three to five days, and return to their homes about the 1st of October, and then, if things look favorable, they may order work to be started up in October or November. All other statements or stories tending to excite men who are anxious to secure work are utterly absurd and without any foundation in fact.

Nevada.

MINING NOTES.—*Transcript*, Sept. 4: Curnow & Sprye, who recently leased the McCutchan mine, at Canada Hill, have struck a large body of ore that has the appearance of being worth not less than $40 a ton, and are now engaged in taking out a crushing. Mr. McCutchan sold this mine to an eastern company for $10,000, receiving $5,500 of the purchase money. He took out from it the last month before he turned it over to them the sum of $3,200, but the company after operating it awhile, and finding that they could not make it pay its own way from the start, got tired of their bargain, and Mr. McCutchan got the property back for the $4,500 remaining due on it. Mr. McCutchan says he would not sell it again for $10,000 cash. It is doubtless a valuable property. Ore worth $100 a ton is being taken from the bottom of the Charonnat mine. That property has not looked better in a long time than it does now. At the Rising Sun mine in Willow Valley drifting is going on in two directions at the bottom of the shaft which is down 160 or 170 ft. The mine yielded well on the first level, and the indications are that it will improve with depth.

THE FOOTE MINE.—*Herald*, Sept. 6: The Foote mine, situated in the Banner Hill mining district, has a very flattering prospect. A survey was recently made for a tunnel to tap the ledge at the bottom of the shaft and which could not be worked without the erection of heavy machinery. After running the tunnel several hundred ft at a heavy expense the ledge matter was run on to one day last week, and it is thought that in about a week or ten days the main lead will be encountered, and which in the old shaft is first class. This mine is owned by the above-named gentleman and is bonded to San Francisco capitalists. Ere long we expect the mine to be rated as a dividend payer.

THE MARSH MINE.—We saw a fine piece of quartz rock at Gaylord's store to-day. The rock is well charged with sulphurets, ocher, galena, and free gold is also visible to the naked eye. The ore is said by competent judges to be high grade. At the mine, which is in the Canada Hill quartz district, they have a 2-ft lead, which improves in quality as work progresses. A crushing was recently had with encouraging results. The owners no doubt have a good paying property, and in the near future it will be one of our regular dividend payers and a source of revenue to the town.

Plumas.

MINING NOTES.—*National*, Sept. 6: In the Mohawk district the Ward (formerly Teff) mine is being run with a force of 10 men, using all the water available, and showing good results. Mr. Jos. Hapgood has made arrangements to put up a mill on his ledge. The Plumas Eureka Co. are adding new machinery to the Johnstown mill. The Four Hills mine is reported as paying handsomely and regularly. A deposit of gravel, 20 ft or more in depth and prospecting well, has been struck in the Red Slide claim on Poormans creek, owned by Kelly, Turner and others. D. R. Thomas is about through cleaning up. Cap. Donahue has begun two tunnels on the ledges in Hopkins creek, owned by his company. Mining matters around Greenville are reported brighter. McIntyre & Johnson have made a strike in the extension of the Lowery ledge and are milling at the Arcade mill, running its full capacity. Justice Emmons has found the main chimney of the New York mine, about 600 ft above the present tunnel, and is prosecuting work as rapidly as possible. The Green Mountain is running a full force of men. A company is reported as being organized in Greenville to take hold of and work the Southern Eureka. Jim Firmstone & Co. are milling their ore from Dixie canyon in the Crescent mill, using 8 stamps for that purpose. Geo. Cornell will start up the Indian Valley mine as soon as possible, having organized a company for its working. The mine was recently pronounced by an expert to be first class, but to have been badly worked.

San Diego.

MESA GRANDE.—Cor. Calico *Print*, August 6: Since my last the mining interests of this section of the country have loomed up. The Shenandoah mine of Mesa Grande is under the able management of Joseph Cox, the well-known mining superintendent, who has the water all out and the sinking gang at work in good ore. The 170-ft level is looking better than ever and they are getting some good ore from the 120-ft level. On the whole the prospects of this mine were never better. About 30 men are at work in the mine and mill besides a dozen or fifteen outside hands cutting and hauling wood, etc. J. Hoke, an old Calicoite, has had a crushing of ten tons from his Red Hill claim, resulting in about eleven ounces, which is quite good considering that he can take out a ton a day to the hand. As yet he is down only about 30 ft and has done very little drifting. The ledge averages about 16 inches. There is but little prospecting being done on La Mesa, although one or two others have prospects, which time alone will prove whether they will pay or not.

San Bernardino.

BULLION REPORT.—Calico *Print*, Sept. 6: Since our report in last issue of the *Print* the following shipments of bullion were made from mines in Calico mining district through Wells, Fargo & Co.'s express: Three shipments from the Silver King mine, $12,775, and one from the Garfield, $5,287. Total shipments since July 1st, $155,470. This is estimating the bullion at its net value. The gross value would be 17 per cent additional, making the total $181,470.

LAVA BEDS.—Calico *Print*, Sept. 6: J. E. Hawkes, of the Lava Beds, has been in town for a few days. He and his family have been stopping at the well near the mines in that district. He has been industriously at work in a mine in which he is interested. He reports but little work being done in the various mines at present. Most of them are lying entirely idle, while several have only a man or two at work in them. The ore seems to be too deep for a poor man to sink for, and the rich surface deposits are not extensive enough to enable him to make returns that will enable him to proceed to any considerable depth. There is plenty of ore in most of the mines, but it requires capital and machinery to work it with a fair profit.

Sierra.

NUGGET.—*Mt. Messenger*, Sept. 6: McLaughlin, Webber and others took out a 23-ounce piece in the creek below John Fessler's ledge, near Alleghany, the other day. The claim is a bank claim, on Kanaka Creek, and was worked about 30 years ago. In a day and a half thirty ounces were taken out. The Rainbow Company has not yet found the ledge that was worked from the shaft. The quartz tapped by the tunnel appears to be broken up into stringers. After following it some distance they went back, and are pushing the tunnel ahead on its course. About fourteen men are employed. The crushing of rock from Mr. Van Slyke's ledge, in Hog Canyon, resulted very satisfactorily. He is now at work sinking the fifth shaft, and in those sunk he finds the ledge five feet wide, and rich. Each of the shafts is forty feet deep. He contemplates putting up a mill in the spring, in Butcher Ranch, to be run by water, of which there is an abundant and never-failing supply. A sawmill will be erected the first thing. Geo. Davis has purchased the old Snake Bar place, formerly owned by Mr. Parke, and will work it this winter. There is a quantity of good ground there that has never been touched.

WORKS BURNED.—Last week Thursday, the cabin, blacksmith shop and the track sheds of the Blue Gravel mine, above Sierra City, were destroyed by fire. Two men were in the tunnel at the time, sinking a shaft; and did not know of the fire until it was over. Coming out they found the mouth of the tunnel too hot to pass, and made their way to the surface through an air shaft. The loss is about $500, besides the great inconvenience and the stoppage of work. The Company have encountered some very fine looking quartz gravel, well washed; but have not yet got down to bedrock

Trinity.

BULLYCHOOP.—Trinity *Journal*, Sept. 6: Mr. B. S. Guptill, of Indeek, was in town this week and from him we learn that quartz mining in Bullychoop district is active and prospects cheering. Hoskins Bros. have a 3-stamp mill running on ore from the Little Gem which averages about $30 to the ton. The ledge is about 2 ft in width and looks exceedingly well. The Bullychoop Company is taking out large quantities of pay ore and is awaiting the erection of the cannon-ball mill, heretofore mentioned in these columns, to get to crushing and taking out money. Arrangements have been made with Guptill & Maloney to pack 100 tons of ore from the mine to the mill. James A. Grant has struck a new chimney on the Central mine which promises to prove a veritable bonanza. Several tons have been run through a 5-stamp mill and goes from $35 to $40 to the ton. Henry & Davis are running a tunnel on the Pound Cake mine. There are a great many men prospecting in the district with varying success, while a number of others are engaged in doing work on old locations sufficient to hold them for another year. Several of the mines which have been opened are now idle and the men have been put to work on the wagon-road now building from Watson gulch, Shasta county, to the mines. About 40 men are now on the road which it is hoped will be completed this fall.

CLOSED DOWN.—Blakemore's quartz mine in Eastman district has suspended operations so far as taking out rock is concerned, there being now on the dump sufficient ore to keep the arastras running for two years, and it being considered useless to take out more rock at present. The ledge looked well where they quit it, and can be depended upon for an unlimited supply of pay ore whenever more is needed.

Tuolumne.

WET GULCH.—Tuolumne *Independent*, Sept. 6: Our enterprising friend, Mr. D. Levy, is pushing work on his mine, at Wet gulch. He is putting up new hoisting works, pump, etc., to be run by water power, and is constructing and doing everything in the most approved and substantial manner possible and will soon be ready to commence the work of developing his property.

THE OAKLAND mine, above Columbia, is being worked systematically, under the direction and management of practical miners. We understand the company are running their new mill day and night with satisfactory results. The mine is owned by a company of enterprising business men of Oakland and San Francisco.

THE HYDE mine is working again, with a small crew of two or three men in the mine. The mill is also running. Rock from the Pennsylvania mine is being hauled to the Soulsby mill. The ore was taken out some time ago. Crushing rock at the Ohio mine commenced this week. Only two men are employed in the mine. It still continues to look well in the vein.

MILL STARTED.—*Union Democrat*, Sept. 6: W. G. Long and J. M. Hampton have started the mill on their claim near Jacksonville. They have an immense vein or body of low-grade ore which can be mined and milled for a nominal cost. If they are successful in making it profitable they have a fortune in store, as the material in the mine is inexhaustible.

NEVADA.

Washoe District.

SUTRO TUNNEL.—Following is the report of progress and details of work in the Sutro tunnel from August 1st to September 1st, inclusive: Main Tunnel—Removed from along the line of the tunnel, between points 1100 and 3800, 107 posts and 42 caps of old timber. Squared ground, and put in 101 posts and 43 caps of new timber; also lagged and braced sets and cleaned up debris. Re-timbering at the following points being completed, measures as follows: West of point 3700 extends 27 ft; east of point 2500, 94 ft, 4 inches; west of 2300, 10 ft, 4 inches, and east of same, 87 ft, 8 inches. Between 7100 and 7200, have put up 2 posts and 1 cap, and lagged the old sets. Between 6400 and 7200, repaired old sets. Cleaned up debris between 10,300 and 17,000. Between 11,400 and 11,600, placed 380 ft of new covers and 8 new sides of 8x8x20 planks on drain-boxes, and from 19,400 to 19,600, repaired track and placed new guard plank on both sides of the same.

HALE AND NORCROSS.—The large double-track drift running north from the 2800 station is making about 45 ft per week. It is skirting the east side of the ore vein and on the west side occasionally cuts into the edge of what appears to be a strong body of quartz. The drift is being substantially timbered as it progresses, and a drain is put in and covered as the drift advances. The drift will be pushed forward to the Savage south line as soon as possible. It is now out a little over 240 ft and has about 200 ft yet to go to reach the Savage south line. They will probably make some cross-cuts in the Hale and Norcross before the drift is extended up to the Savage line. The usual amount of ore is being taken out on the 200 level and they are preparing to commence operations on the 500 level, with a view to which the machinery at the old shaft is being put in good repair.

MEXICAN.—Virginia *Enterprise*, Sept. 6: The joint Ophir, Sierra Nevada and Union Con. winze below the 3200 level has been sunk and timbered about 8 ft. The usual vein porphyry is taking the place of the bastard quartz which has heretofore been the predominant material at the bottom of the winze. The winze has but about 4 ft to go to reach the 3300 level. It will then be sunk about 10 ft further for a sump, when a station will be opened and a drift started west toward the mineral-bearing quartz found further to the west on the levels above. In speaking of the winze having 4 ft yet to go, we mean that it will to-day be 96 ft below the 3200 level, and will yet have 4 ft to go to reach the 3300 level.

BEST AND BELCHER.—The main west drift on the 2500 level is out about 630 ft. It has passed through the hard rib of porphyry, and is entering a softer and more favorable material. The drift must now be quite near to where should be found the continuation of the body of low-grade quartz cut through on the 2300 level. The north drift from the 825 station of the Bonner shaft is out about 340 ft. It is in a very favorable material.

UNION CON.—On the 3200 level the joint Mexican, Ophir and Sierra Nevada winze has been sunk and timbered 8 ft. After to-day it will have but about 4 ft to go to reach the 3300 level. A sump will be sunk to the depth of 10 ft, when a station will be opened at the 3300 level and a cross-cut started west toward the point where the streaks of gold-bearing quartz were found above. As these streaks of quartz stood about vertical, they must be looked for to the westward.

CON. CALIFORNIA AND VIRGINIA.—The air pipes and car-tracks have been removed from the 2900 to the 1700 level. At the latter point a drift will be started north, passing around the section bulk-headed in some years ago on account of a fire in the old timbers. The drift will be kept outside of the section in which was the fire. It is being

run partly for ventilation and partly to look for the northern extension of the streaks of ore that were being worked in the region where the fire occurred.

ALTA.—The west drift on the 2150 level has been driven through the west wall of the vein and discontinued. It showed a body of quartz 150 feet in width. The water is fast draining out through the two diamond drill holes that were run from the face of the east drift on the 2150 level. The flow of water has so far decreased that the miners will be set to work next Monday at driving the drift ahead toward the vein.

SCORPION.—On the 500 level the north drift is passing through vein porphyry that contains seams of clay and frequent stringers of quartz of a favorable appearance. The company have a vast area of ground (covered on the surface with huge masses of croppings) which should contain rich deposits of ore, but about which not much is known, except on the 500 level.

BENTON.—The drift on the 2150 level is making very good headway in a body of quartz that carries as high as $10 a ton in metal. It is hoped that in going northward on this body of quartz a paying deposit will be found at some point as the quality of the material improves as work progresses in that direction.

OPHIR.—On the 250 level some ore is still being extracted from the fillings of the old drifts. On the 500 level they now have an ample supply of air and are pushing forward the main west drift about 70 ft a week.

SIERRA NEVADA.—Are still repairing the drift on the 2300 level through which passes the compressed air pipe.

CHOLLAR.—Cross-cut No. 2 on the 2800 level is making rapid progress in material of a very favorable character. There is no trouble with water.

ANDES.—A station has been opened at the bottom of the 80-ft winze and a prospecting drift started at that point.

CROWN POINT.—The usual quantity and quality of ore is being taken out on the old upper levels and sent to the mills on the Carson river. A considerable amount of prospecting work is being done.

UTAH.—The material encountered in the south-east drift on the 1950 level is much the same as at last report. The streaks of quartz and seams of clay still continue.

BELCHER.—Sufficent low-grade ore is being extracted to keep the river mills in full and constant operation.

YELLOW JACKET.—About usual quantity and quality of ore is being extracted and a considerable amount of prospecting work is being done.

Banner District.

The Ready Relief, in Banner, has started up at reduced wages, and is getting along slowly. The mill is not running, as C. R. Wellington, with a force of men, is busily making repairs on the same. The Old Hubbard is proving herself to be a paying property. One hundred tons of ore from the waste dump was run through the mill, with a $1,000 result. The Cowles Brothers have worked hard to develop their property and deserve all the good fortune they get.

CARESA CREEK.—Some rich strikes are reported from the desert close to Caresa creek, silver assaying up in the thousands and nickel up to the hundreds, so don't be surprised if the Caresa Creek mining camp (that is to be) leaves Calico in the shade.

Columbia District.

THE POLARIS.—*Times-Review*, Sept. 6: It is the intention of the managers of the Polaris mine, at Columbia, to sink immediately 60 ft further, which will give a depth of 200 ft when drifts will be run and stoping commenced. It is hardly probable that the mill will be started up this season, but work will be prosecuted in the mine, extracting ore and opening up, preparatory to more active operations in the spring. Experienced miners and experts who have examined the mine are unanimous in the opinion that it is the most promising property in the northern country, while its favorable location for easy and economical working, and the facilities for cheap reduction of its ores, are important factors in the estimation of its aggregate value.

Eureka District.

ORE SHIPMENTS.—Eureka *Sentinel*, September 6: Messrs. Anderson & Dibber have been prospecting the Western Globe mine for the past two years, and have made several shipments of rich ore from about the old stopes to the furnaces in Eureka during that time. The upper levels of the mine are so obstructed with waste that it has become necessary to prospect at greater depth, and they are now sinking a winze in virgin ground, with good chances for striking a new ore body. If successful, they will commence running a tunnel from the nearest accessible point in Maryland Mountain, a little above the Rescue Canyon road. The sooner the work is commenced the better it will be for the owners, as there can be no doubt that it will be the means of discovering plenty of ore beneath the old stopes, the indications of which are plentiful. Not only this, there are also veins of ore cropping out of the surface, which the tunnel would cross-cut and be the means of exploring at a fair mining depth.

Julian District.

There is but little doing in the Julian mines. Some little ore taken from the San Diego, which pays wages. Some from the Blue, which worked $118 a ton. Nothing being done in the Big Blue. Work is still progressing on the silver mines near Julian and the owners think they have a bonanza. They claim that some assays have run as high as $1,100, and that the average is $90.

Osceola District.

WORKING ORE.—White Pine *News*, Sept. 5: John Irvine, who has just returned from Osceola, informs us that 33 tons of ore from Capt. Aikey's mine, worked at the Osceola Company's mill, yielded $33 per ton; and 27 tons from Boone Tilford's mine, worked at the same place, yielded $80 per ton. The people over there think it very unfortunate for the district that one or the other of these properties did not fall into the hands of the Osceola Company.

Pinto District.

PROSPECTING.—Eureka *Sentinel*, September 6: There are 25 miners prospecting on Maryland Mountain, Pinto District, 19 of whom are taking out rich ore. Messrs. Finn, Ferguson and Fox have a lease of the surface workings of the Rescue mine, and are taking out some very fine ore, with a prospect for a plenty of it. Andrew Berryman & Co. have a fine prospect on the Silver Nugget mine, Pinto District, which they are working under lease. They are taking out considerable middle class, and some very rich ore. John Steel is making a shipment of 60 sacks of good ore from the old dump, at the Diagonal mine. He is assisted by Charles Fisher, and will resume work shortly in a drift from the main incline, 25 feet below the surface. This is being run on a fissure of fair quality of ore. John Killen has a lease of all that portion of the Queen mine, above the 100 level. He is on the track of ore, and will probably have something soon to repay him for his labor. The lower levels of the mine are being worked by the owners; Messrs. Jones Brothers, who have a small vein of rich ore in the bottom level, which looks as if it might develop into a rich body, such as one of those for which the mine has been famous.

Secret Cayon District.

RICH ORE.—Eureka *Sentinal*, Sept. 6: H. B. McKee and Co. have struck a vein of enormously rich ore in the Endeavour mine, Secret Canyon. Specimens of which will run as high as $18,000 per ton. These have a plentiful sprinkling of free gold which can be seen in the rock without the aid of a glass. This ore is also exceedingly rich in silver, and is very heavy for its bulk. It is to be regretted that the vein is very small but it may increase with depth. Ed. Altweg has some very rich ore on the dump of the Bricktop mine, some of which shows well in horn silver. The Bricktop series adjoin the Geddes & Bertrand mine, Jim Lurry is leasing the Scorpion mine. He has a nice streak of quartz in one shaft, and on another, a body of quartz, rich with chloride and horn silver. It promises to develop finely.

Silverado District.

TUNNEL.—Eureka *Sentinel*, Sept. 6: Jim Nolan, who is as full of energy as an egg is of meat, is running the Grand Republic tunnel rapidly into Silverado Mountain. It is now in 445 feet, and the breast in ore-bearing lime-rock. In a few weeks, cross-cutting will be commenced to intersect the east and west ore veins, a number of which appear in the croppings.

Silver Park District.

BONDED FOR $60,000.—Pioche *Record*, Sept. 3: The mining property owned by Felix Knight, in Silver Park Mining District, we are informed by Elwood Bailey, was bonded for $60,000, in place of $25,000, as has been reported. The property is bonded to a Mr. Eppley, of Salt Lake, for five months, with a forfeit of $1,000 a month, till the mining property is taken. Mr. Knight has obtained U. S. patents to the Summit, Roadside, and Sam Tilden claims, and owns a number of good prospects besides these. A large amount of ore has been stripped and exposed to view in these mines.

Tuscarora District.

NORTH BELLE ISLE.—*Times Review*, Sept. 4: No. 2 cross-cut, east 70-ft level, has been extended 8 feet. Have cut into the east vein, which shows a width of over 2 feet, and carries some high grade ore.

GRAND PRIZE.—South drift on the 400-foot level has been extended six feet. The stopes above the 400 are better than last week. Stopes above the 300 are doing well. Mill is running and doing good work.

BELLE ISLE.—Drift north from east cross-cut, 150-foot level, has been advanced 9 feet; total length, 28 feet. The face shows a good width of milling ore.

NAVAJO.—There is some improvement to note in the south drift, on the 250-foot level; progress the past week, 8 feet. The stopes on this level are looking well at all points. The faces of all the drifts are showing the usual width and grade of ore.

White Pine District.

HAMILTON NOTES.—White Pine *News*, Sept. 5: The Sweetwater Mining and Milling Company are steadily progressing in their different works. During the past week there have been seventeen men in and about the mill employed on repairs. The recent strike in the Stafford continues to improve, the assays ranging higher. J. R. Kendall puts on a force of men to-day upon the Manhattan (California) mill to place things there in order. He has let a contract to two parties to furnish 1,000 cords of wood on the wagon road, where it can be hauled in. Capt. Frank Drake speaks in high terms of the recent discovery on Treasure Hill. He thinks it is likely to prove a large body. Frank Paul, a son of S. F. Paul, of Hamilton, was the discoverer of the bonanza. He had a contract to run 50 ft of a drift, and when he had finished, he noticed an improvement in the ground and kept right on till he unearthed the new find. If it turns out as expected Frank ought to have a long job in that mine.

ARIZONA.

CASA GRANDE.—Cor. *Globe Chronicle* Sept. 6: The Casa Grande Copper M Co., under the management of Wm. B. Hellings, at Copperopolis, has two smelter jackets ready for work under the supervision of J. J. Williams, formerly of the Old Dominion Co., and they started turning out copper bullion last Saturday with average success. It is claimed that they have struck another large body of ore in one of the tunnels. They have erected a coke platform to unload coke handily at this point from the cars of the Southern Pacific Railroad.

MOHAVE MINES.—*Miner*, Sept. 1: Of all the wealthy mining camps of Mohave county, Stockton Hill takes the lead, both in the great variety and richness of its ores, as well as in the number and extent of its mineral-bearing ledges. Here are found veins of gold, silver, lead, copper, antimony, zinc and other minerals, only needing capital and labor to enable them to add their hidden stores to the wealth of the country. There are now some fifty men engaged in mining on Stockton Hill, while more are being added every few days. The Franklin mine, is owned by Wm. Engle and Caldwell Wright where three men were found at work stoping out a piece of ground lying between two shafts, and taking out some very fine ore, which was sorted up into two classes, the first of which assays in the neighborhood of $300 to the ton in silver, while the second class ore runs about 100 ozs. The Moonbeam mine, is owned by J. M. Gale & Co. Here five men were found at work, extracting the precious metal, and the metal from this claim is indeed precious, seeing that the last car-load of ore from the mine sampled 397 ounces in silver at the Cerbat mill, while the second class ore runs about 90 ounces. Mr. Gale is at present occupied in both sinking and stoping and with five men is taking out about 2 tons of first class ore and five tons of second class ore per week. The old Cupel mine, has contributed a larger amount than any other claim to the sum total of the wealth extracted from the mines of Stockton Hill. In early days chloriders took out as much as $175,000 from this valuable claim, the surface of which is at present entirely honeycombed with old workings. This claim needs to be sunk to a depth of at least 500 feet before it can be again put on a paying basis. At present there are two or three men sorting over the old dumps which they have purchased of Messrs. Spruance Stanley & Co., owners of the mine, and they appear to be making a good thing out of it. Up to date they have shipped two car-loads of ore to Pueblo, and have some 320 sacks more, ready for shipment.

REDUCED WAGES.—Prescott *Courier*, Sept. 3: The new arrangements under which the miners at Tombstone will resume work at reduced wages, promises to restore its old time prosperity to Cochise county. As the cut in wages is due solely to the falling off in value of the quartz produced by the principal mines, we hope to see the old rates re-established with the looked for early development of new ore bodies.

MOHAVE MINES.—*Miner*, Sept. 6: The Gold Basin district will soon come to the front again. Messrs. Hall & Co., of Denver, will commence work in a few days to prepare for the erection of their mill. An abundance of water has been found and no further difficulty is anticipated on that score. Dave Parkes and Tom Tyrrell are working on the Southern View, at Wallapai mountain, and taking out ore that will assay about $600 to the ton. The work of connecting the tunnel and main shaft on the Deen mine for the purpose of obtaining good ventilation still goes bravely on. According to actual measurement the distance from the floor of the tunnel to the bottom of the shaft above is 124 ft, of which 100 ft was completed last Thursday in just 4 weeks from the time of commencing the work, and as the men are making 4 ft a day it will be but a few days until the connection is made. When this is done more men will be put on and large shipments of ore may be expected. J. M. Quine is shipping some fine galena ore from his claim near Sherum's peak.

IDAHO.

COEUR D'ALENE MINES.—*New Northwest*, Sept. 6: Mr. Stillwell arrived here this morning. He got into the Coeur d'Alenes last spring; has an interest in three producing claims, and is out for a few days' business. He is an experienced miner and a reliable man. He gives it as his opinions that the Coeur d'Alenes are good. Of the 2,000 men there, nearly all are at work. Recently there were no idle men; but a few days ago a company taking out a 12-mile ditch to carry 4,000 inches of water from Pritchard creek to the old gravel beds between Eagle and Butte, suspended and discharged 250 men, which leaves some idle. The enterprise is a promising one, and he thinks it will be completed yet this winter. A considerable number of companies have not got to sluicing and are generally doing from fair to first rate. The bankers now estimate the weekly product of the gulch at from $8,000 to $10,000. This is being taken out by about 300 men. It is the hardest gulch to open he ever worked in. The ground is deep, densely covered with timber, very flat, and the water is troublesome. The gold in the shallower diggings is mostly on bedrock.

MONTANA.

A TEMPORARY SUSPENSION.—*Inter-Mountain*, Sept. 2: For the past three years, almost without interruption, operations have been continued at the Anaconda, and with ceaseless regularity the cages have ascended and descended the shaft. The machinery and workmanship in the mine have been of the best. The utmost care has been taken to procure durability and prevent delay, and all that was possible in this direction has been secured. But iron will wear, and shaft timbers will settle and get out of plumb, which is the cause of the shutting down of this property for the next week or two. The air compressing apparatus is in need of extensive repairs, and the guides in the shaft require adjustment. The men cannot work in the mine without air, and it is impossible to work in the shaft with cages constantly running up and down, and the present was thought the best possible time to prosecute the necessary repairs and put the mine in shape.

NEW PLACER DIGGINGS.—A special dispatch to the *Independent*, from Benton, says that city is all excitement now over the report that rich placer diggings had been discovered in the Little Rocky Mountains, about one hundred miles east of Benton. Parties are rapidly outfitting to go. Gold from the new mines has been sold at Maiden and Fort Assinaboine, and it is said that it was taken out without sluice-boxes or any of the usual facilities for washing. The discovery gulch is five miles in length. The trip can be made from Benton in mackinaws down the river, as the gulch is only a few miles from the river. A big stampede is expected.

THE HELENA CO.—Helena *Independent*, Sept. 8: The Helena Mining and Reduction Company's property has taken its place in the front rank of the valuable mining properties of the country, and demonstrated in a most striking manner the difference between the close, careful and systematic working of a property by skillful and trained manipulators and the hap-hazard operations of novices or mere empirics. A large outlay has been made during the last year in order to secure the economical development of the mines and the reduction of their output, but the profits of the company have kept steadily advancing beyond the expenditures made upon the mines and works, and the ratio of cost of manipulation has been largely reduced in the mean time. A good idea of the progress made in the direction of economical handling of the ores may be had by observing the present cost of smelting as compared with the earliest operations of the old Alta Montana Co. upon the same property, when the mere cost of running the furnace charge through the water-jacket aggregated more than twice the present cost of the entire operation of roasting and smelting. These results, reached so satisfactorily, are largely due to the fact that the present works are properly constructed as well as properly operated. With all the vast product of ore worked from the Alta and Comet mines since the immense works were completed, the quantity now in sight in each of these veins is estimated to be quadruple the quantity available when they were started under present auspices. The tunnels that have penetrated the Alta mountain have opened up an entirely new chute of ore that is now known to extend from the lowest point opened, fully 750 upward, and the characteristics developed are as promising as at any point in the older workings of the mine. The Emerson lode is owned by the Clancy Creek M. Co., and is at the head of Clancy creek, about half way between Bald Mountain and Gregory mine. A tunnel has penetrated the hill on which this lode is located for a distance of 100 ft, and has struck pay at a distance of 170 ft from the surface, and the vein matter has been explored for a distance of 9 ft across from the first wall encountered without reaching the other wall. Another tunnel at "Old Baldy" is running into the mountain on the Buckeye lode to strike the vein at a depth of 250 ft below the present shaft, which is now 50 ft deep and shows the vein at the bottom to be about 3 ft wide. At the present lowest point reached it is claimed that the pay streak carries from 50 to 80 ounces of silver to the ton. It is owned by the Bald Mountain Mining Company of Minneapolis. An important purchase has been made recently by Elijah M. Dunphy, of this city, who now owns exclusively the General Grant, General Sherman, and General Jackson lodes, and three-fourths of the Good Friday, besides the water rights, ditches, etc., formerly owned by Andrew J. Arnold and others on Red Mountain in the vicinity of the Nellie Grant mine—a large proportion of which is also owned by Mr. Dunphy. It is understood that within a short time these valuable properties will be developed by a large tunnel driven into the mountain so as to cut several leads. As to the richness of these lodes there is no doubt whatever. W. S. Negus and H. T. Jacobs are making good returns for their outlay in the Homestake mine in the Stemple district on the main range. On the 5th of July they bought in $12,000 gold, and on the 23d inst. they cleaned up $10,000 more in their little mills and Mr. Jacobs says they "have better rock now." These two clean-ups came from less than 400 tons of ore. The sixty stamps of the Drum Lummon mine will start to-morrow, and if the returns from this famous property do not surprise those who have not been "taking notes" lately, then it will be on account of some accident that will cause unlooked for delay. With the increasing returns from the mines at Wickes, Maryville, Gloster, Elkhorn, and other tributary camps, Helena is destined soon to register shipments of the precious metals to the markets of the world in such amounts as will bring her name into prominence in every quarter of the globe.

NEW MEXICO.

VICTORIA DISTRICT.—Cor. Globe *Chronicle*, Sept. 5: Victoria mining district is situated in the southern part of Grant county, N. M., 30 miles north of the lines of Old Mexico, and 3 miles south of Gage station, on S. P. R. R. The district received its name in commemoration of old Victoria, who, in years gone by, made this his stamping ground. The mines were discovered about three years ago, and have proven, under present management, to be dividend paying. They lay on the summit of a round limestone mountain, which is situated in an open prairie. Said mountain rears its peak 300 ft above the surrounding plain. The ore is a carbonate, which lies in pockets or chimneys, and when once opened is very easily extracted. It is then freighted on wagons to Gage, from there shipped to Socorro and smelted. The average grade of ore from this mountain is about $50, and is uniform, varying only a few dollars in several thousand tons. Development work is very slow and expensive, owing to the silicious and irony nature of the limestone, but when once a drift is run or a shaft sunk, it never requires timbers, which makes a compensation for labor and money expended in running through such hard rock. There are two groups of mines which produce ore steadily. The first I will mention is the Victoria, which is owned by a St. Louis company. Mr. Frank Nicholson is general manager, and has been in St. Louis since the commencement of work until very recently. He has now come to stay a few months and has brought along with him that ever indispensable being to man's happiness—a lovely and accomplished young wife. Since last February the company has cleared $40,000, making the owners financially happy. The Chance mine adjoins the Victoria on the south and is a very valuable property. The ore is, as in the Victoria, in large deposits, encased in limestone, and is superintended by Mr. Neil Boyle, an old and experienced miner of Nevada. It has produced some 20,000 tons of ore in the last two years, and has several thousand ready for shipment. The town or camp is called Fullerton, and consists of about 20 houses, frame and adobe. Water is hauled from Gage in tanks for mine and town use.

UTAH.

REVIEW.—Salt Lake *Tribune*, Sept. 5: The receipts of bullion and ore in this city for the week ending September 3d, inclusive, were, of bullion, $118,858.48; of ore, $7,850; of both, $126,708.48. For the previous week the receipts of bullion were $105,989.14; of ore. $12,840; total $118,829.14. During the same week the Horn Silver shipped nineteen cars of bullion, $57,000; bringing the total shipments for the year up to $1,669,000, out of which three regular dividends of $300,000 each have been paid. The Ontario shipped during the week 46 bars of bullion, assaying $33,778.08. Its product for the year to this date amounts to $1,128,067.64. Out of this eight regular monthly dividends of $75,000 each have been paid. The Crescent sent in two lots of ore, of the value of $5,000. The Stormont sent up two bars of silver, worth $3,160. The product of the Hanauer smelter for the week was nine cars of bullion, $16,950.

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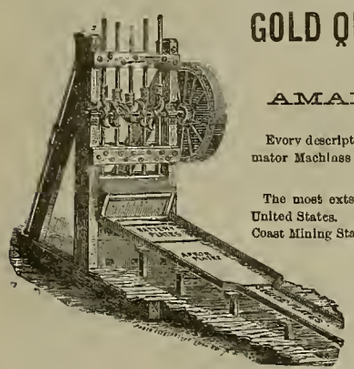

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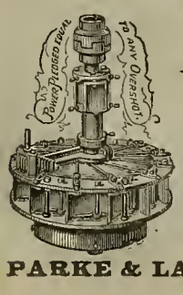

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We are aware that the most sweeping and pretentious claims are made for nearly every concentrator in the market, but it is a well-known fact that the results of their operation have not in any instance made good these claims. The advantages here set forth for the Duncan, as well as the statements made, we are prepared to substantiate by actual working results. **Price, $350. Weight, about 1,750 pounds.**

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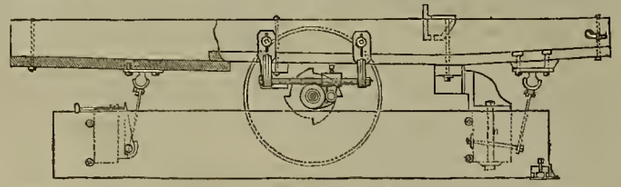

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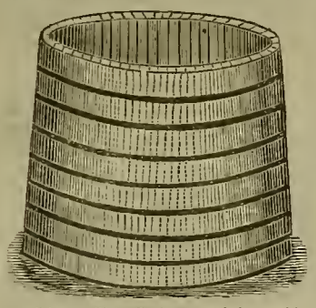

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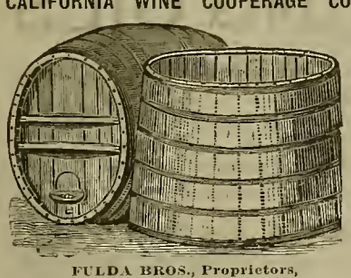

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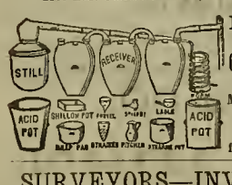

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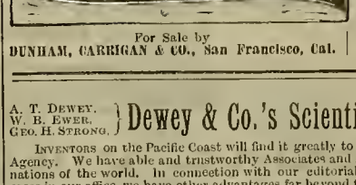

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The "Triumph". Concentrator to the Front Again.

Having started the ball in motion; having inaugurated the recent agitation in regard to the important subjects involving the best methods of concentrating the valuable metallic particles of ores, and the best forms of concentrators, pans, vanners, separators or other concentrating devices, we ask you to again afford us space in the columns of your valuable mining and scientific journal for a further discussion of the matter, and in reply to the article which appeared in your issue of August 30th.

The proper concentration of ores suggests a problem of vast complications, and innumerable machines have been conceived, devised and constructed, intended to solve this knotty proposition which affects the immense pecuniary interests of all mining men and mine owners in all of the mining districts of the world.

This agitation which, in its incipiency, involved only the merits and demerits of the "Triumph" Concentrator and "Frue" Vanners has already, at this early stage, drawn into the controversy the "Duncan" pan and its aged father the "Hendy" amalgamator, and the pseudo "Embrey" machine, and the probabilities are that the rag, tag and bobtail of other conceptions will soon be following the procession.

Believing in the merits of the "Triumph" Concentrator, we invite, and are prepared for a fair, free and full discussion of the merits of any and all machines which may enter the lists, and we hope that one or a series of competitive trials may be arranged, in order that the superiority of either one or another may be fairly, impartially and decisively determined. We ask this for the reason that the best interests of mining men everywhere will be ultimately subserved by the open and honest competition which we propose.

Reverting to the article dedicated to the "Frue" Vanner of August 30th, above alluded to, we have to say that touching upon the matter of patents and infringements, we deem these to be properly subjects of judicial investigation and decision, and appreciating the sound basis upon which the patents of the "Triumph" Concentrator rest, we are ready to guarantee their purchasers against all losses, damages or expenses which may be incurred by them by reason of any infringements of any existing letters patent of any other concentrating devices.

With regard to the competitive trial recently had between two "Triumphs" and two "Frues" at the Empire mill, in Grass Valley, we wish it to be distinctly understood that every fact and figure stated in the articles which appeared in your journal of August 16th and in the daily and weekly *Stock Exchange* of August 21st and 22d, were compiled and derived from written and verbal reports of the Superintendent of that property, and nothing was concealed or exaggerated. The statement that "40 ounces of amalgam were saved by the two 'Triumphs,'" was made verbally by the Superintendent in the presence of the managing owner of the O. E. M. and M Co., the President of the Joshua Hendy Machine Works, and the writer of this article. Without questioning its reliability we embraced the coin value of the stated amount of amalgam saved to the compilation of figures, and being given to us officially, the right to use them cannot be doubted. We have, however, now at hand a complete report of the trial, over the signature of the superintendent, which modifies this amount of amalgam, but changes no other figure or statement heretofore made use of. The quantity and value of the amalgam actually saved was verified by the superintendent after his return to Grass Valley, and accurately ascertained to be 5 ounces, having a value of $5.00 per ounce, or $25.00, taken from the feed-bowls of the two "Triumphs;" none being saved by the two "Frues," we therefore make the "amende honorable" for this unintentional error.

The net gain of the "Triumphs" over the "Frues" is consequently as follows, viz.:

Net value of concentrations	$199.15
Net value of amalgam	25.00
Net gain in favor of "Triumphs"	$224.15

The fact that the "Frue" Vanners do not save any amalgam, is substantiated not only by the result of the test cited above, but by Isaac E. James, Esq., superintendent of the Carlisle Mining Company of New Mexico, in his report of a competitive trial had in February and March last, in the mill of that company, between five "Frue" Vanners and six "Duncan" pans, under his personal supervision, and verified over his own signature, and in which he states that *no amalgam was saved by the five "Frues."*

With reference to the question(?) of *too much water*, alleged as a reason why the *"Frues worked under a great disadvantage,"* we have this to say, and we think the answer will be sufficiently explicit to any mill or mining man; that an exactly equal distribution of ore-pulp and water from the two batteries over the four machines, being perfectly arranged and provided for by pulp troughs and delivery pipes, that each of the four necessarily received the same quantity of pulp and water, and operated under equal conditions, and there being *too much water* for the "Frues," why was there not *too much water* for the "Triumphs"? Echo still answers, "why!" The fact is, there was not a sufficient quantity of either pulp or water delivered to the two "Triumphs" during the test to determine their full capacity. In proof of this we cite the fact that 450 tons of pulp were distributed to the four machines during the run of 24 days, which gives an average delivery of only 4.65 tons of pulp, to each machine, per day of twenty-four hours; and we claim that where ores contain not more than three per cent of sulphurets or pyritic matter, that three (3) "Triumphs" will properly concentrate the gangue matter from two batteries of 5 stamps each, say 10 stamps, having a crushing capacity of two (2) tons per stamp per day, or say 6.66 tons of pulp, to each concentrator per day.

Passing to a consideration of the statement, that "the tailings from the 'Triumphs' assayed one-half higher than the 'Frue' tailings, etc.," we state that samplings of the tailings from the four machines were carefully taken at appointed times during each day of the trial, and that we have had each day's samplings carefully assayed by W. D. Johnston, Esq., assayer and chemist of this city. The mean results of those assays show an *excess of loss* in the tailings passing from the "Frue" Vanners of $1.02 per ton over those passing from the "Triumphs."

We have had these assays tested by other assayers, but the correctness of Mr. Johnston's results carries its own verification in the fact that the gross gain of the "Triumphs" over the "Frues" was as follows:

Gross gain in value of concentrates	$222.31
Gross gain in value of amalgam	25.00
Total gross gain	$247.31

Or say, $1.10 per ton for the 225 tons treated, and we find the *excess of loss* in the tailings passing from the "Frues," for 225 tons at assay value, $1.02 per ton equals $229.50 — demonstrating that the loss by the "Frues" was gained by the "Triumph."

The insinuation thrown out by the agents of the Frue Vanning Machine Company, that "our acceptance of their $1,000 challenge was an attempt to make capital cheaply by advertising what we have no intention of performing," is not up to the standard of business qualifications with which we have heretofore credited those gentlemen. When the challenge was originally offered there were certain improvements being made in the construction of the "Triumphs," and, as we have before stated, we bided our time until those improvements should be perfected. It ought to be a matter of congratulation to the agents of the "Frue Vanner" (to the amount of one thousand dollars) that we did not accept the wager for the trial at the Empire mill, for we should have pocketed that sum had they had the fortitude to put up.

The fact remains that we have publicly accepted the challenge, and we now and hereby reiterate our acceptance of the same for $1,000, or any other sum, and are ready to enter into a competitive trial with two or more "Triumph Concentrators" against an equal number of "Frue" Vanners, upon the following terms and conditions, viz.:

1st. That arrangements for a suitable quartz mill of standard stamping capacity and proper pulp delivery accommodations, shall be provided.

2d. That the trial shall continue during a certain number of consecutive days.

3d. The best form of and materials entering into the construction of the machines, combined with the least wear and greatest apparent durability.

4th. The most satisfactory practical operation, with the greatest ease of adjustment, and the minimum amount of power required in driving, together with the largest quantity of pulp treated, and the most perfect uniformity and steadiness of motion.

5th. The largest net bullion value accruing from the yield of concentrations and amalgam (estimated separately).

6th. The least loss of value per ton in the tailings; and that perfect fairness, the strictest impartiality, and honest operations, shall be the factors and conditions which shall determine the test; and upon these terms we are willing and eager to take the chances, and if the fates be against us, we shall neither quibble, squirm nor squeal.

JOSHUA HENDY MACHINE WORKS.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug. 21.		WEEK ENDING Aug. 28.		WEEK ENDING Sept. 5.		WEEK ENDING Sept. 11.	
Alpha	1.25	1.75	1.25	1.45	1.60	2.00	1.45	1.65
Alta	1.90	2.65	2.10	2.40	2.10	2.30	1.95	2.45
Andes	.25	.30	....	.25	.20	.25	....	....
Argenta	....	....	.15	.25	....	.15	....	.15
Belcher	.85	.95	.85	.90	.30	.90	.30	.90
Belling	....	....	....	....	....	....	....	....
Best & Belcher	2.25	2.55	2.20	2.35	2.30	2.45	2.30	2.50
Bullion	.55	.60	....	.50	.50	.60	....	.45
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	.65	.85	.70	.75	.60	.65	.55	.60
Bodie Con	1.95	2.15	1.90	1.95	1.65	1.85	1.95	2.15
Benton	.35	.50	.40	.75	.50	.65	.55	.70
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	....	.60	....	.50	....	....	....	....
California	.10	.15	....	.15	.10	.15	.15	.55
Challenge	....	....	....	.15	.20	.25	....	....
Champion	....	....	....	....	....	....	....	....
Chollar	1.80	3.50	1.80	2.60	3.60	3.00	2.15	2.70
Confidence	....	1.00	....	....	....	1.00	....	....
Con. Imperial	....	....	....	....	....	.05	....	....
Con. Virginia	.25	.40	.35	.40	.25	.35	.25	.30
Con. Pacific	....	.55	....	.55	.55	.60	....	.60
Crown Point	1.40	1.45	1.30	1.35	1.30	1.40	....	1.25
Day	....	....	....	....	....	....	....	....
Eureka Con	....	....	....	....	....	2.50	....	....
Eureka Tunnel	....	.50	.40	.55	....	.55	....	....
Exchequer	.35	.45	.30	.40	.40	.45	....	.40
Grand Prize	.50	.60	....	.50	.30	.50	.40	.45
Gould & Curry	1.90	2.30	1.90	2.05	2.00	2.40	1.95	2.25
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	2.40	3.00	2.75	3.25	3.10	3.60	2.75	3.35
Holmes	....	....	2.50	3.00	....	....	....	2.60
Independence	....	.30	....	.25	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	....	.30	.15	.25	.15	.20	.15	.25
Martin White	....	....	....	....	....	.30	....	....
Mono	.70	.90	.60	.70	.60	.65	.70	.95
Mexican	1.50	2.05	1.45	1.60	1.50	1.70	1.50	1.60
Mt. Diablo	....	2.60	....	....	....	2.25	....	....
Northern Belle	....	....	....	....	....	....	....	....
Navajo	4.00	4.20	4.00	4.15	3.50	4.15	3.60	3.90
North Belle Isle	.30	.35	....	....	....	....	....	....
Occidental	....	....	1.25	....	1.25	....	1.10	1.10
Ophir	1.05	1.35	1.05	1.20	1.10	1.25	1.10	1.25
Overman	.15	.20	.15	.20	.15	.30	.15	.20
Potosi	1.00	1.85	.95	1.05	1.05	1.75	1.35	1.65
Pinal Con	....	....	....	....	....	....	....	....
Savage	.90	1.05	.95	1.25	1.25	1.70	1.20	1.40
Seg. Belcher	....	2.00	....	....	....	....	....	....
Sierra Nevada	1.35	2.10	1.30	1.50	1.45	1.65	1.35	1.50
Silver Hill	....	....	....	....	....	....	....	.10
Silver King	....	....	4.25	4.50	....	4.50	....	....
Scorpion	.25	.30	....	.25	.25	.30	....	.25
Syndicate	.40	.45	....	.45	.45	.55	....	....
Tioga	....	....	....	....	....	.05	....	....
Union Con	1.05	1.50	1.10	1.20	1.15	1.30	1.15	1.20
Utah	.75	1.25	....	.95	1.00	1.15	.80	.90
Yellow Jacket	1.95	2.00	1.75	1.90	1.70	1.90	....	1.75

Bullion Shipments.

Vienna, Sept. 5, $7,946; Navajo, 5, $12,000; from Helena, Montana, for August, $91,603; from Tuscarora, Nev., for August, $59,632; Hanauer, 2, $5,800; Horn Silver, 2, $15,000; Ontario, 2, $14,557; Vienna, 2, $3,086; Horn Silver, 3, $3,000; Hanauer, 3, $1,950; Stormont, 3, $3,160; Crescent, 3, $2,250; Horn Silver, 4, $12,000; Ontario, 4, $4,232; Horn Silver, 5, $3,000; Ontario, 5, $4,450; Hanauer, 5, $5,500; Crescent, 5, $3,500; Nevada, 5, $1,800; Day, 6, $4,444; Horn Silver, 6, $3,000; Ontario, 6, $4,254; Vienna, 6, $3,224; Horn Silver, 7, $12,000; Ontario, 7, $5,273; Vienna, 7, $18,871; Hanauer, 7, $5,600; Stormont, 7, $3,820; Wood River, 7, $2,000.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Arnold G & S M Co	Arizona	2	50	Aug 1	Oct 1	Oct 28	A Judson, 320 Sansome st
Alaska M and M Co	Alaska	7	1.00	July 22	Aug 26	Sept 16	E F Stone, 306 Pine st
Alta S M Co	Nevada	30	50	Aug 21	Sept 25	Oct 15	W H Watson, 302 Montgomery st
Boracic Acid M Co	California	3	05	July 21	Aug 25	Sept 15	H C Droger, 303 Montgomery st
Benton Con M Co	Nevada	13	25	July 22	Aug 26	Sept 15	W H Watson, 302 Montgomery st
California M Co	Nevada	13	20	Aug 4	Sept 11	Oct 8	C P Gordon, 309 Montgomery st
Caborca M Co	Mexico	9	05	July 18	Aug 22	Sept 22	H C Edgerly, 328 Montgomery st
Chollar M Co	Nevada	14	50	July 23	Aug 26	Sept 15	C L McCoy, 309 Montgomery st
Champion M Co	California	16	10	Aug 22	Sept 26	Oct 16	T Wetzel, 522 Montgomery st
Con Imperial S M Co	Nevada	21	10	Sept 1	Oct 7	Oct 28	C L McCoy, 309 Montgomery st
Excelsior W & M Co	California	7	50	Sept 2	Oct 7	Oct 28	W J Stewart, 215 Sansome st
Eintracht Gravel M Co	California	16	05	Aug 26	Sept 1	Oct 18	H Kunz, 209 Sansome st
Equitable Tunnel M Co	Utah	30	40	July 29	Sept 15	Oct 7	W A Van Bokkelen, 419 California st
El Dorado Con M Co	Nevada	3	04	Aug 16	Sept 19	Oct 8	J H Sayre, 330 Pine st
Enterprise M Co	California	1	15	July 1	Sept 13	Oct 4	W Van Bokkelen, 419 California st
Golden Fleece G M Co	California	33	50.00	Aug 6	Sept 10	Sept 27	F Schermier, 412 Sixth st
Martin White M Co	Nevada	18	25	July 25	Sept 4	Oct 2	J J Scoville, 309 Montgomery st
Morgan M Co	California	11	1.00	July 3	Aug 30	Sept 22	C S Neal, 309 Montgomery st
North Gould & Curry M Co	Nevada	7	25	Sept 3	Oct 6	Oct 23	C H Mason, 331 Montgomery st
New York Hill M Co	California	9	20	July 29	Sept 2	Sept 23	J B Lightner, 327 Clay st
Ophir M Co	California	1	50	Aug 30	Sept 29	Oct 18	Ganeard, 9th and Market st
Potosi M Co	Nevada	16	50	July 29	Sept 2	Sept 23	C L McCoy, 309 Montgomery st
Savage M Co	Nevada	60	50	Sept 5	Oct 7	Oct 27	E B Holmes, 309 Montgomery st
Summers Con M Co	California	1	05	Aug 18	Sept 22	Oct 16	F E Luty, 330 Pine st
Summit M Co	California	7	05	Aug 4	Sept 3	Sept 23	G W Sessions, 309 Montgomery st
Santa Anita M Co	California	7	02	July 30	Sept 2	Sept 23	J M Buffington, 306 California st
Utah S M Co	Nevada	50	50	Aug 19	Sept 22	Oct 11	G C Pratt, 309 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Aultman M & M Co	California	J P Hopkins	309 California st	Special	Sept 15
Day S M Co	Nevada	E M Hall	327 Pine st	Annual	Sept 16
Grand Prize M Co	California	E M Hall	327 Pine st	Annual	Sept 16
Mono M Co	California	G W Sessions	309 Montgomery st	Annual	Sept 19

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	G W Sessions	309 Montgomery st	50	June 5
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Aug 26
Idaho M Co	California			4.00	Apr 2
Jackson M Co	California	D C Bates	309 Montgomery st	10	Mar 16
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 21
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Apr 28
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Mar 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Sept 5

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Sept. 11.

1115	Alta	2.20@2.25	
150	Alpha	1.65	
400	B. & Belcher	2.30	
100	Benton	.40c	
100	Bullion	.50c	
100	Bodie	2.05	
200	Belle Isle	.55c	
350	Chollar	2.25@2.30	
500	Con. Virginia	.25c	
150	Con. Pacific	.60c	
500	California	.25c	
115	Exchequer	.35@.40c	
585	Gould & Curry	2.10	
200	Grand Prize	.40c	
1040	Hale & Nor	2.80@2.85	
100	Holmes	2.75	
100	Independence	.25c	
300	Mono	.95@1.00	
350	Navajo	3.70@3.75	
180	Ophir	1.35	
400	Potosi	1.40	
850	Savage	1.25	
170	Sierra Nevada	1.55@1.60	
100	Silver King	4.50	
590	Union	1.35	

AFTERNOON SESSION.

100	Alpha	1.55@1.60	
1300	Alta	2.10@2.15	
70	B. & Belcher	2.45@2.50	
20	Belcher	.90c	
1150	Benton Con	40c	
400	Chollar	2.65@2.70	
1030	Con. Virginia	.25@.30c	
380	Gould & Curry	2.25	
500	Hale & Nor	3.35	
200	Justice	15c	
320	Mexican	1.50@1.55	
100	Mono	.70c	
150	Navajo	3.60@3.65	
350	Ophir	1.15	
100	Potosi	1.65	
385	Sierra Nevada	1.45@1.50	
1150	Savage	1.35@1.04	
50	Utah	.90c	

Mining Share Market.

The stock market shows a slight advance at the close of the week, though there is little animation in the market. Work is progressing favorably at all points along the Comstock lode, and very important work will be commenced soon in several places. The joint Mexican, Ophir, Sierra Nevada and Union Consolidated winze will soon be down to the 3300 level. A sump 10 feet in depth will then be sunk and a station opened, from which a cross-cut will be started west for the veins of gold-bearing quartz found above. As the quartz encountered above stood about vertical, it must all be looked for to the westward; none of it made its appearance in the lower part of the course of the winze. At the Imperial, Alpha and Exchequer, they have developed a large and strong body of quartz on their 600 level, but it carries only a few dollars a ton in the precious metals. It is thought this deposit may be better toward the surface, and an upraise will now be started and pushed to the 500 level, where explorations will be made.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING SEPTEMBER 2, 1884.

304,398.—MATCH SPLINT MACHINE—Arnold & Wimmer, S. F.

304,499.—TRACE BUCKLE—Wm. J. Butler, Salinas, Cal.

304,631.—SAW JOINTER—John Eutsler, Wallace, Cal.

304,431.—SHOE—C. J. Heyler, San Jose, Cal.

304,329.—FARM GATE—L. J. Johnston, Petaluna, Cal.

304,537.—ROCK BREAKER—Geo. H. Malter, S. F.

304,658.—SHUTTER WORKER—Masters & Kimball, Sacramento.

304,343.—TREE PROTECTOR—F. H. Merrill, S. F.

304,469.—SHINGLE MACHINE—C. A. Tarragen, Portland, Or.

304,373.—PICK—D. E. W. Taylor, S. F.

Patents Allowed.

Among patents recently allowed, and not yet announced, we are at liberty to mention the following which will soon issue:

METAL SHEARING APPARATUS—R. I. Knapp, Half Moon Bay, Cal.

RAILWAY CAR—Henry Root, S. F.

SULKY CULTIVATOR—W. H. Roberts, Santa Clara, Cal.

CULTIVATOR—M. M. Estee, S. F.

WRENCH—B. Elmore, Etna, Cal.

DERRICK FORKS—C. Stone, Walnut Creek, Cal.

JOINT PROTECTOR AND IGNITER FOR FUSE—E. A. Thompson, Silver City, I. T.

VEHICLE SIDE SPRING—Z. M. Howell, Salida, Cal.

ENGINE VALVE—H. Behr, S. F.

BALANCE ROTARY VALVE—H. Behr, S. F.

BALANCE ROTARY VALVE—H. Behr, S. F.

BALANCE ROTARY VALVE—H. Behr, S. F.

BALANCE SLIDE VALVE—H. Behr, S. F.

BUILDING CONSTRUCTION—E. L. Ransom, S. F.

GRAIN SEPARATOR AND CLEANER—A. W. Lockhart, Sacramento.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise), at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
J. J. BARTELL—Sacramento Co.
A. C. KNOX—Nevada (State.)
B. W. CROWELL—Fresno and Tulare counties.
GEO. MCDOWELL—Plumas and Sierra counties.
WM. PASCOE—San Francisco.
WM. H. COOK, Los Angeles Co.
H. G. PARSONS—Idaho and Montana.
G. W. IOALLS, Arizona.
M. S. PRIME—Contra Costa county.

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Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

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May we suggest as the result of a long experience in the manufacture and use of Oil, the following facts:

1. Generally, twice as much Lubricating Oil is used as is necessary.
2. The Oils generally used in the West, cost too much money.

There is no use of paying the high prices necessarily demanded for Lard, Tallow, Castor, China-nut, and other animal and vegetable Oils sold for Lubricating purposes.

WE GUARANTEE TO SAVE FROM 25 TO 50 PER CENT.

☞ Please write us briefly for what purpose the Oil is used, and we will return GRATIS enough oil to prove what we say. Our oil has now been adopted as

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252 Market Street, San Francisco

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ECLIPSE DOUBLE TURBINE WATER WHEEL

Points of Superiority:

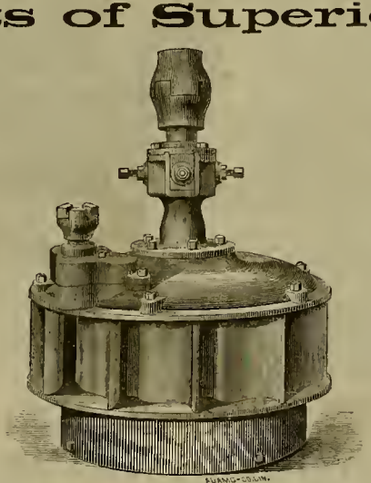
FIRST.—Simplicity, being composed of the smallest possible number of parts.

SECOND.—The Wheel, Outer Case, Register Gate, and Top, each being one casting, and all the work on them being performed by machinery, and fitted to a standard gauge, secures the highest perfection in construction and operation, and the utmost strength.

THIRD.—The entire absence of rods, bolts, levers, light castings, or "traps" of any kind, securing the greatest durability, with entire immunity from derangement of parts and breakage, so common in all complicated wheels.

FOURTH.—The conical interior of the wheel, which secures perfect freedom of vent for both tiers of buckets, enabling the wheel to rid itself immediately of "dead water" without friction. This feature is entirely original with this wheel, and is found to be of very great practical importance.

FIFTH.—Its "Duplex Chute," formed by the Register Gate and outer case. The outer case moulds the current of water, delivering it in a solid body through that part of the Chute comprised in the Register Gate on to the wheel. This Chute being fixed, the direction of the



current is never changed, nor its velocity checked, consequently nearly the same per cent. of power is obtained with the gates only partially drawn as when fully open.

SIXTH.—A Gate thoroughly protected from vertical pressure, which, when partially closed, does not break the column of water or change its proper direction, which is easily operated, and yet shuts so tight as to prevent leakage; and the shutting of which is not likely to become obstructed or prevented by foreign substances.

SEVENTH.—The housing up of the pinion and segment for operating the gate, which entirely prevents all danger of breakage by foreign substances getting between the teeth. No other concern does or can use this improvement, which effectually does away with a source of most frequent annoyance and delay.

EIGHTH.—The amount of power it yields, together with its Simplicity, Durability and Strength, fairly entitles our wheel to the name given it, The Eclipse Turbine. In further proof of the power of this wheel, we invite a careful inspection and comparison of our tables with corresponding tables for all other similar wheels.

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IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

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THIS WAS ONE OF THE FOUR WHEELS TESTED by the Idaho Company at Grass Valley, Cal., and gave 90 2 per cent., distancing all competitors. Send for Circulars and guaranteed estimates.

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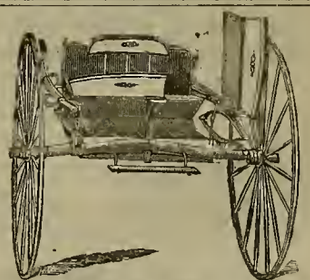

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The Spring Shaft does away with the disagreeable motion of the horse, and the open seat affords easy and safe access from the rear. It costs less to ship, is Light, Neat Stylish and easy riding.

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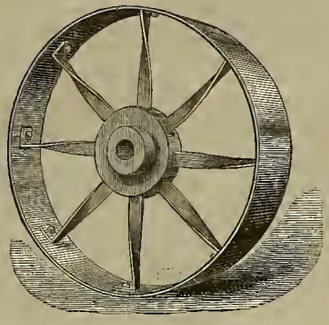
Iron and Machine Works.

MACBETH'S
—PATENT—
STEEL PULLEY.



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They are less than half the weight of cast-iron pulleys; are polished on the face; are made either crowned or straight, and are turned in the lathe the same as the best make of cast-iron pulleys.

They are carefully balanced. They are subject to no contraction strains, and can be run at very high speed without danger of bursting.

On account of their great lightness and the form of the arms, they absorb less power than any other pulley.

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They are very true, and are about 50 per cent lighter than the cast-iron pulleys in our No. 1 mill.

Yours faithfully,
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[Signed:] RICHARD T. MARSH,
Managing Director.

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MANUFACTURERS OF
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Manufacture Iron Castinge and Machinery of all Kinde at Greatly Reduced Rates.

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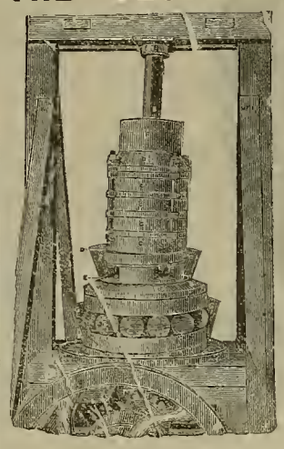

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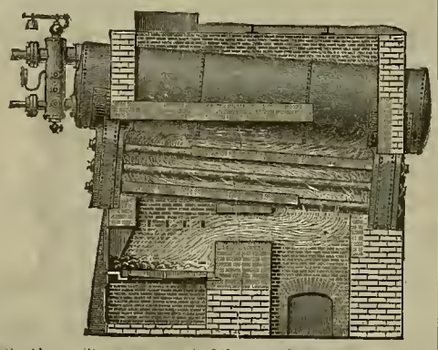

TESTIMONIALS.

ST. LOUIS, MO., Sept. 23, 1883.

Messrs. Adolphus Meier & Co.—GENTLEMEN, We cheerfully certify that the "*Heine Patent Safety Boiler*" put up by you in our establishment has proved very satisfactory in its working. The chief points of excellence in the "Heine Safety Boiler" are its economy in fuel and space, freedom from scaling, aptitude for power and heating purposes, working equally well with clear and muddy water. We warmly recommend it to all using steam machinery. Yours truly,

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OFFICE OF SUPT OF ROYAL RAILWAYS, BERLIN, Sept. 23, 1883.

To Mr. H. Heine, Civil Engineer: In reply to your inquiry of September 2d, we respectfully inform you that the three boilers built under your patents, under steam since September 25, 1881, at the Alexander Place Depot, as well as the two at Friedrich Strasse Depot, under steam since September 22, 1882, have given good satisfaction, requiring no repairs whatsoever to date. The internal cleaning of the boiler was always accomplished with ease on account of the convenient arrangement of the tube caps, the adhesion of scales being fully prevented thereby, and the boilers kept in prime condition.

(Signed): BRAUCKE.

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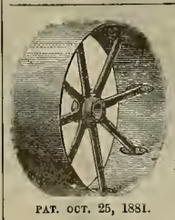

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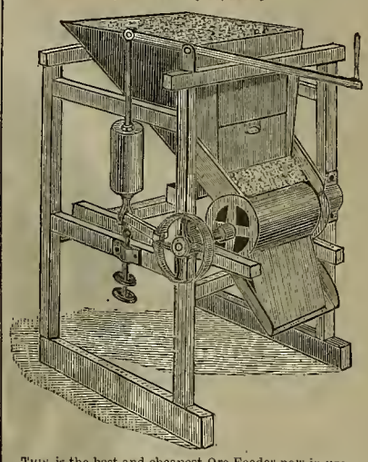
[Patented May 28, 1882.]



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It has fewer parts, requires less power, is simpler in adjustment than any other. Feeds coarse ore or soft clay alike uniformly, under one or all the stamps in a battery, as required.

In the Bunker Hill Mill it has run continuously for two years, never having been out of order or costing a dollar for repairs.

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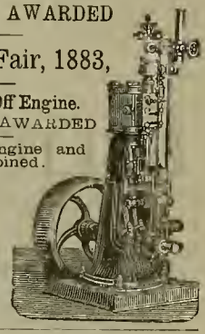

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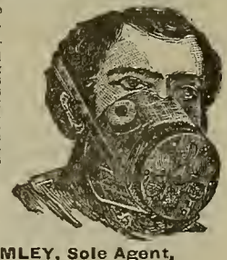

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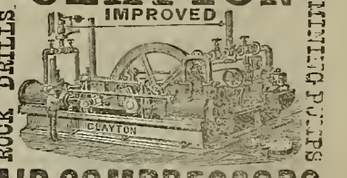

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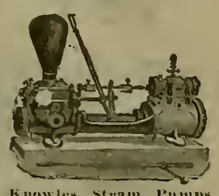

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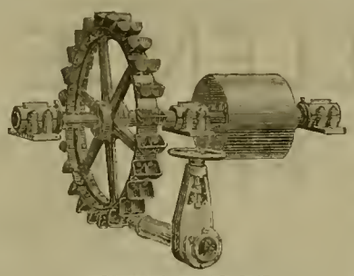

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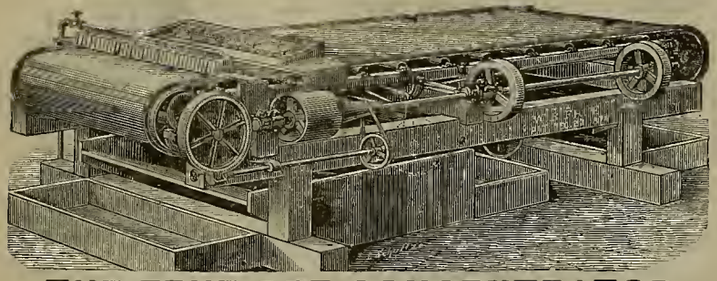

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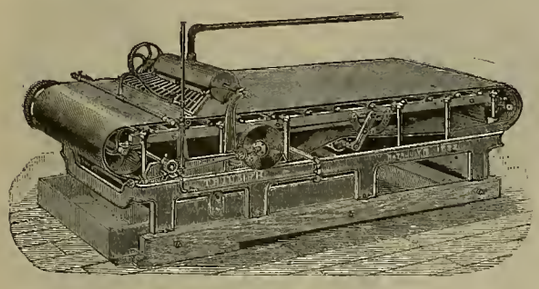

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These returns do not include the value of the amalgam saved by the "Triumphs" during the test; which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarily saved, which is lost on the "Frue" Vanners.

This trial was conducted under the personal supervision of the Manager and Superintendent of that Company, in a strictly fair and impartial manner, and with the sole view of determining, in the interest of that Company, the merits and demerits of the respective machines by a thoroughly practical test. A relation of the course of procedure, a concise analysis of assays, and a tabulated statement of the net bullion results, with accurate deductions therefrom, will soon be published in Circular form.

The superiority of the present construction of the "Triumph" over the form originally introduced, together with the demonstrated results of the above, and other trials had with the "Frue" Vanners, induce us to and **we hereby accept the Challenge of $1,000**, flaunted by the Agents of the "Frue Vanning Machine Company," and hold ourselves in readiness to enter into a second competitive trial for that sum, at such place and upon such terms and conditions as may hereafter be mutually arranged.

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Nos. 39 to 51 Fremont St., San Francisco, Cal.

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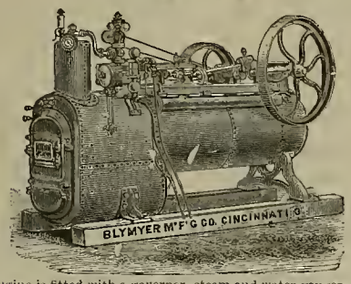

Each engine is fitted with a governor, steam and water gauges, heater, fine brush, waste and blow-off cocks, brass whistle, smoke stack with spark arrester, oil cups, gauge cocks, combination check and stop valve, and pump.

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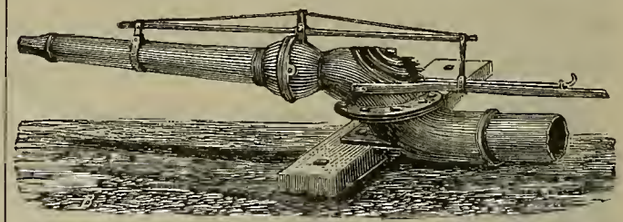

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California Inventors

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BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, SEPTEMBER 20, 1884.

VOLUME XLIX. Number 12.

The Clerk Gas Engine.

We give on this page a cut illustrative of a ten horse-power gas engine, manufactured by the Clerk Gas Engine Company of Philadelphia, Pa., for the sale of which the Joshua Hendy Machine Works, of Nos. 39 to 51 Fremont St., this city, are the agents for the Pacific Coast States. These engines are designed to meet a want long felt in this community, for many economical uses, being safe, light and durable, and admirably adapted for many purposes where steam power cannot be employed.

They are specially serviceable for use as motors for printing offices, workshops, laundries, factories, where sewing and bag machines are operated, and in hotels, public institutions and private buildings where pumps, elevators or electric lighting machines are in use, and generally in cities and towns (where gas is obtainable) for all mechanical operations requiring small driving powers.

They are extremely simple in their construction, have no gearing wheels, and are noiseless in their movement. One ignition is made at every revolution, instead of one ignition in two or more revolutions, as occurs in most other forms of gas engines, and the power produced is therefore greater for the size of the engine. By a special and simple arrangement, all tendency to back ignition is avoided, and these engines may be operated to their entire available capacity without irregularity.

Their power being very large in comparison with their weight, they can be placed and operated on lighter foundations or floors than any other style of high-power gas engines, which is a matter of important practical convenience and consideration.

Special attention is given by the manufacturers to simplicity of detail in their construction, and their material and workmanship will be found to be in accordance with the best mechanical engineering practice. The Joshua Hendy Machine Works have numerous testimonials of their efficiency and economy from users in England, France and the United States.

Estimation of Sulphur in Coal.

Sulphur generally exists in coal as a sulphuret of iron, and as the presence of more than two per cent of sulphur depreciates the market value of coal, owing to its destroying the iron boilers and grates under and over which the coal is consumed, it is always an important part of the examination of coal to ascertain the quantity present. Mitchell recommends the following process to determine amount of sulphur:

Take one part of finely pulverized coal and mix it in 7 to 8 parts of niter, and 16 parts of common salt, and 4 parts of carbonate of potash, all of which must be perfectly pure. The mixture is then placed in a platinum crucible and gently heated at a certain temperature; the whole ignites and burns quietly. The heat is then increased until the mass is fused; the operation is finished when the mass is white.

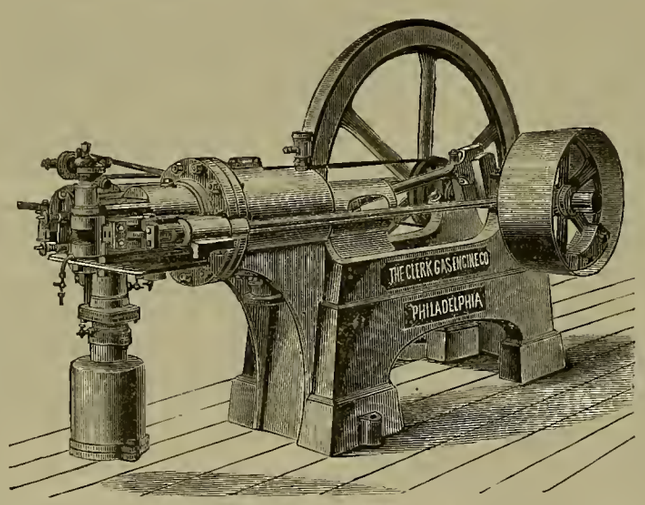
It must when cold be dissolved in water, the solution slightly acidulated by means of hydrochloric acid, and chloride of barium added to it as long as a white precipitate forms. This precipitate is sulphate of baryta, which must be collected on a filter, washed, dried, ignited, and the filter burnt away, and the remaining sulphate of baryta weighed; every 116 parts of it indicate 16 of sulphur.

Hoisting Ropes in Mines.

On account of the weight of unbalanced winding-ropes in mines, large engines are needed to start the load, and a number of plans have been devised to meet the difficulty. Many years ago some degree of compensation was gained by the flat hemp ropes coiling upon themselves, which were in general use; and similar ropes of aloes fiber are still preferred in Belgium and France, but they are almost entirely displaced in England, Germany and America by round ropes of iron or steel wire coiling upon a plain cylindrical drum. To counterbalance the rope in these cases, heavy chains attached to a secondary drum, or weighted levers, have been used. The drum has been made conical, the first lift being taken at the smallest diameter; but the extent to which this can be carried is limited, and it is scarcely safe to make the pitch of the cone more than an angle of 30 degrees with the horizon. By adding a spiral groove in which the rope can lie, this angle may be increased so as to make the drum almost strictly compensating; and this scroll drum (the principle of which was patented so long ago as 1776) is the one now being adopted at most of the largest modern winding plants in Europe. Round ropes, coiling upon themselves in a vertical groove between two iron discs, are in use at Clifton colliery, near Manchester, and are giving satisfaction, as the ropes are found to retain their form and to wear well. With a plain cylindrical drum the empty winding-rope may be effectually counterbalanced by attaching a rope of similar weight underneath the cage. Herr Koepe, of Hannover colliery, Westphalia, has revived a system of winding by which the usual drum may be dispensed with, and its place taken by a simple sheave of large diameter, which may be fixed over the shaft. The main rope from one cage passes partly round this sheave, and is attached to the other cage, while a secondary rope of like weight hung beneath the cages serves as a counterpoise; or the winding-rope may be an endless one, passing through the cages, which are attached thereto by clamps. This system is now in work at Bestwood colliery, near Nottingham.

Using Waste Coal.

The utilization of which are ordinarily waste products is a question which is being studied by many persons. In no branch of industry is there so much waste as in the mining and preparation of anthracite coal. The Philadelphia and Reading Coal and Iron Co., not very long since, found, by estimation, that they had over 60,000,000 tons in their dirt banks, of which about 40,000,000 tons could perhaps be utilized. This includes remarkable sizes of coal, from "buckwheat" to "small stoves;" they have put up jig houses to sort this coal. This company burns the culm or waste under 200 boilers, and at 15 or more collieries. At very few of these collieries have they been burning what is known as good coal for years. They burn "slag," the result of the slate pickers' labors, but in this there is plenty of good coal. Not very long since they determined to burn culm instead of coal. The method adopted at the Schuylkill colliery, where there are eight boilers, is as follows:



THE CLERK GAS ENGINE.

Immediately behind the breaker stands the culm bank. The boilers were built up against the bank, and these furnaces were furnished with sheets of perforated iron instead of bars. Each has a blower of the steam jet pattern. From all accounts, culm raises steam more quickly than coal. The fireman opens the furnace door, and going to the culm bank, not ten feet away, throws in shovelful after shovelful from the bank. Large pieces of rock and slate find their way into the furnace, as well as other material. The rock and slate come out of the fire in much the same condition as they go in—a little cracked and the rock perhaps shriveled, but by no means consumed. The other parts of the bank are burned to ashes.

A mixture of anthracite slack or culm, with bituminous coal, is largely used in New England. The culm is also used in some locomotives, which use the Wootten boiler for generating steam.

A VESSEL came into port this week from Germany, with 600 tons of scrap iron for the Oakland Nail Works.

Patent Office Models.

For a great many years the Patent Department of the United States Government required models of inventions to be sent with the application for patent. The rule worked a hardship on inventors, who, in very many cases, had to spend more money for their models than for fees and other expenses of the application. Sometimes these models cost up into the hundreds of dollars. The expense of transmission from distant points added to cost also. In addition to the models drawings had also to be made.

Some little time since the rules of the Patent Office were changed, so that models are no longer required, except in special cases. The officials have a right to call for a model should the apparatus or mechanism be so complicated that a drawing does not give a sufficiently clear idea. But in most cases no models are asked for, the drawings alone, with the specification, being sufficient.

This is here stated for the information of many who suppose models of inventions are still essential. Persons who applied for patents some time ago, when models were necessary parts of the application, and now applying again, are not all aware of the new regulations. All that is now necessary is a good, clear specification, written by an expert in such matters, and plain drawings of details, varying in number and elaborateness according to the subject. This makes the drawing of specifications a somewhat more difficult matter than formerly, owing to the specification writer having frequently to work from very crude drawings, as people cannot always explain exactly in a clear manner what they have invented. With models to work from, of course a writer can more easily understand details. But when good drawings are made they answer every purpose of the model. It was a wise provision of the Patent Office to abolish the models.

THE COMET CRUSHER.—The suit of David R. Fraser, Thomas Chalmers and H. H. Scoville, Jr., vs. The Gates & Scoville Iron Works, which has been pending for some time in the Circuit Court of the United States for the Northern District of Illinois, has lately been decided in favor of the complainants (Fraser, Chalmers & Scoville). This suit was brought for the infringement of letters patent of the United States granted to J. W. Rutter, being Re-issue No. 3,633, dated September 7, 1869. The Court, Judge Blodgett sitting, held the Rutter patent to be valid, and found that the said defendant, the Gates & Scoville Iron Works (now the Gates Iron Works) had infringed the first claim thereof. This decision was obtained after a full hearing. The crushers known as the Comet contain the invention secured by the said Rutter patent, which covers an important feature. The crushers manufactured and sold by the Gates & Scoville Iron Works advertised as "The Greatest Crusher on Earth," contain the same valuable feature, and, as decided by the Court, are an infringement of the said Rutter patent, which Messrs. Fraser & Chalmers control. Messrs. Fraser & Chalmers, the manufacturers of the Comet crusher, have issued a circular calling the attention of parties using "The Greatest Crusher on Earth" to the fact that they are liable, as well as the manufacturers, for using machines infringing upon patents controlled by them.

Quartz Jewelry.

An Industry Confined to the State of California.

The making of quartz jewelry is peculiarly a California industry. Its manufacture, says the *Chronicle*, was begun in the early days following the gold discovery. At first miners and others of that class had the quartz roughly cut and as roughly mounted it in gold in some shape approaching an ornament. The two firms who twenty years ago represented the quartz jewelry industry were of this city and conducted business under the name of R. B. Gray and Frontier & Bellmere. Both have long since abandoned the business and have divided the mantle of their trade amongst several jewelers. But the city is too small to permit of any house making one branch of business a specialty and though there is one firm which has given to California quartz a great prominence in its manufacturing establishments, yet the patronage for quartz trinkets, compared with more valuable articles, is so small that it hardly pays the proprietors tomore extensively engage in its manufacture. No proverb is truer than that "no prophet is without honor save in his own country," and this saying is equally applicable to the jewelry under discussion. Though quartz can be made and is made into the most tasty and varied ornaments, yet the demand for them by our own people is very slight. Some few instances have been quoted of a miner who, liking to recall to his memory the remembrances of his hard-working days when he toiled in the mountains, buys for himself and his female relatives large quantities of this jewelry, but these instances are very few and are daily growing less. With Eastern tourists and English wanderers who are "doing" the country the sale is large, and as a class they are remarkably appreciative of the work bestowed upon this industry. It is true that in most cases it is bought as a souvenir of their stay in California—that is, when those articles are purchased which are more properly intended for the use of ladies. But as the jeweler manufactures heads for walking-canes and elaborate snuff-boxes, it may be confidently expected that some of this ware is not destined for the cabinet of curiosities with which so many travelers delight to incumber their reception halls.

Quality and Cost.

Though quartz fit for the art of the jeweler is found all over California, the best is that coming from the mines of Grass Valley. It is not often that a miner comes across rock which would find a sale among the jewelers. The gold has to be evenly distributed and not lumpy, so that after it has passed through the necessary stages which prepare it for setting, the spots and seams of gold are well scattered through the rock. The quartz which the miner thus procures is sent down either to a bank or an assay office, and from there the jeweler receives notice that a consignment is ready for auction. The bids then depend entirely upon the state of the stock held by the different bidders, and should a jeweler happen to be in want of quartz, the amount paid would perhaps be double that which he would pay upon any other occasion. As a rule, the jeweler pays much higher for rough quartz than would one who desired to purchase solely for the gold to melt. The quartz as taken by the jeweler is brought in lumps weighing from one to ten pounds, and in this condition it is handed over to a mechanic for the purpose of being cut into slabs. The process is an easy one, and is nearly similar to that followed by the marble cutters. The saw by which this operation is performed is circular, and is made of sheet tin and charged with water and emery. The quartz is held up to it, and in its revolutions it divides the quartz. The slabs into which the rock is cut do not generally exceed one-eighth of an inch in thickness. The preliminary work is then over. It is not till the jewelry is made—the fittings, as it were—that these slabs are again cut, then fitted into the gold and cemented. It is then ground off level with the gold, and finally polished till it assumes that brightness as when exposed for sale.

Coloring and Imitation.

The coloring of quartz is extremely rich and varied, being found in the same section of country in white and black and pink and blue. Hitherto there has been no preference expressed by the buyer for the color of the quartz in the trinket. Perhaps this has been obviated by the jeweler, who, in the manufacture of even the smallest article, never fails to give as varied an assortment of quartz as is possible. The method of the valuation of quartz rock is peculiar. It is first weighed as any other matter and then under water, as rock weighs next to nothing when under water surface. The amount of gold imbedded in the rock can by this process be determined. There have not been wanting men who have attempted to make an artificial quartz to be used in the manufacture of large goods, in the way of card-tables and similar articles, but decided failure has followed each and every undertaking. Whether quartz jewelry will ever become fashionable is a question which the business men of this city give no long thought. They declare their inability to use quartz fantastically, or to sufficiently fine it down so as to cut it into delicate flowers or leaves. There is an air of substantiability about all the trinkets made for ladies, which, though handsome, have somewhat of a clumsy look. And then the jeweler has to contend against a difficulty which lies on the opposite side. Quartz cannot be had in sufficiently large pieces to use in the manufacture of objects of use and ornament. Some years ago a jewel casket was made in this city for the wife of a certain rich judge, which in itself was a marvel of beauty and excellence of design, it being of solid gold and quartz, having four panels, each one five inches in length and three inches in width. The cost incurred in this work was enormous and the amount of labor incredible. Some slight estimate of the trouble may be formed when the maker of the casket had to employ a man who traveled for two entire months through the different mines in search for quartz of sufficient size to execute the order.

It cannot be exactly said that there exists no demand for this jewelry outside California, for orders have been filled for people in Chicago and Salt Lake, and it is considered that the demand for this in the northern territory induced one or two jewelers in Portland to undertake its manufacture. After diligent inquiry among several workers it was estimated that not over $150,000 worth of quartz jewelry is disposed of in this city during a year and not $25,000 worth is bought by the people to wear in San Francisco.

The New Orleans Exposition.

We have had much to say of the preparations being made to make a display of the natural resources and productions of California at the New Orleans world's fair, but we have hardly found time hitherto to give a comprehensive sketch of the exposition itself, its facilities and prospects. As this is the fair season, and our readers' minds will naturally turn to information of this kind, we deem it timely to sketch the great coming event in New Orleans, our new neighbor on the southeast. The Exposition will open in December and continue until May following:

The first record of cotton as an industrial product for export in this country is the account of the shipment of six bags (about one bale) from the port of Charlestou, S. C., in 1784, to England. In one century the export has increased four million fold and the production to seven million bales, and to a value as an export in excess of any known product. The National Cotton Planters' Association, at its annual meeting in October, 1882, by resolution, suggested the propriety and policy of celebrating by a special cotton exposition the centennial of that now leading and greatest product of southern industry. The outcome of that resolution is the World's Industrial and Cotton Centennial Exposition. The publicity and agitation of the project developed such wide-spread and spontaneous interest, and met with such a popular and enthusiastic response, that its scope was immediately enlarged and made to cover all products and subjects capable of being brought within the purview of a complete, comprehensive and exhaustive exposition. By the foresight and sagacity of its projectors, through an act of Congress it was given an international character, and virtually placed under the auspices of the general government; Under this act the Board of Management and Commissioners for all the different States and Territories were appointed by the President, and official invitations were extended to the governments and people of all the countries and nations in the world to be represented and participate in the exposition.

The objects of the exposition, as can easily be seen, have become manifold. Primarily, to illustrate the wonderful development in production, manufactures, uses and consumption of that greatest of southern industrial products, cotton, its scope was enlarged to cover all other products of the soil and mine, thus to disseminate among the people of all sections and nations throughout the world a knowledge of the resources, products and industrial and manufacing possibilities of the southern and southwestern States. Then, by embodying in its project, not only the products of the soil and mine of this country but of all the countries of the earth, not only the illimitable issues of nature but the myriad handiwork of man's ingenuity and skill, to make it the exposition of the age. Secondarily, by this grand interchange of experiences, this comparison of products, this generous rivalry of manufactures, to pave the way to the establishment of intimate trade reations with vast territories, so that the Crescent City, commanding the gateway to the grandest system of internal water transportation on earth, and possessing a harbor affording secure anchorage and safe access to the merchant marine of the world, can be the medium for the exchange of the products and manufactures of the great West, North and South, for the rich ores, choice fruits and unique and valued productions of Mexico, the West Indies, Central and South America.

A world's exposition where everything that is evolved by nature and wrought by man can be seen voluminously presented, artistically and attractively garnished, with magnificent and abundant housing, with all possible adjuncts of exhibits and display, cannot fail to pique curiosity and secure gratification. An exposition held at the most unique and attractive city on the continent—a city clothed in perennial verdure, with a mild and genial climate, at a season when elsewhere nature assumes her most rugged and forbidding aspect —will certainly draw by this token many, many thousands. When every line of transportation, readily and heartily recognizing its widely pervading influence in promoting general prosperits, its surprising utility in developing and extending trade relations, decreases its rates to a minimum, it cannot fail to move multitudes.

The World's Industrial and Cotton Centennial Exposition is held under the auspices of the United States government, the National Cotton Planters' Association and the city of New Orleans. The general government has appropriated $1,300,000 for its purpose, the citizens of New Orleans have contributed $500,000, the city of New Orleans has appropriated $100,000, the State of Lonisiana $100,000, and various other States, with large numbers of counties, cities and towns, have appropriated amounts varying from $500 up to $25,000, for the purpose of having their exhibits prepared and made at the exposition, while of foreign countries Mexico leads with an appropriation of $200,000, while many other appropriate amounts from $5,000 upwards.

The city park, a beautiful tract of high and dry land, covered with fine groves of the majestic live oak, lying between St. Charles avenue and the left bank of the Mississippi river, has been assigned by the city council for the uses of the expositon. The city park is in the garden district of the Cresent City and possesses unusually superior advantages for prompt and comfortable access. Five street car lines and two steam car lines reach it from the center of the city, while by water the navies of the world can reach its very threshold.

The main building (now about completed) is the largest building ever erected. It covers, under one continuous roof, thirty-three acres of space. It is 1,386 feet long and 905 feet wide, or one-fourth by one-sixth mile in dimensions. The government building, to contain the United States Government and State exhibits, will be of itself one of the largest exposition buildings ever erected, being 885 feet by 565 feet. The horticultural hall is likewise the largest horticultural building ever erected, being 600 feet in length by 190 in width, with a tower 105 feet in hight. It will contain, without a doubt, the most magnificent floral and horticultural display ever grouped. The resources of the most beautiful gardens of this continent are being utilized to this end—Mexico, the Central American States, and the various tropical islands and countries, are absorbed in generous, but eager rivalry, in making the issue the completest, grandest display of the age. The art gallery and numerous other buildings will be in keeping with the magnitude of the exposition.

The prospects of no other exposition were ever before so brilliant. The applications for space at no other exposition, up to similar period, have been so great in number, so varied in subject, so large in space required.

The results flowing from the World's Exposition cannot fail to be most salutary and to exert a widely beneficent influence over the whole country. The diffusion of knowledge, the interchange of valued experience, the exhibition of the highest skill, the consentration of the best results of ages, the comingling of the people from all climes will leave impressions, the influence of which will be felt for generations.

Mining Laws of New Mexico.

The following is the territorial law in relation to mining claims in New Mexico:

Be it enacted by the Legislative Assembly of the Territory of New Mexico:

SEC. 1. That on and after the first day of April, 1884, in addition to the present requirements of law in regard to the location of mining claims, the locator of a mining claim shall within ninety days from the date of taking possession of the same, and previous to placing the same upon record in the county clerk's office, shall sink a discovery shaft upon such claim to the depth of at least ten feet from the lower part or rim of such shaft at the surface; or shall drive a tunnel, open cut or adit upon such claim exposing mineral in face at least ten feet below the surface.

SEC. 2. All laws or parts of laws in conflict with this act are hereby repealed.

TRANSPORTATION OF MINING MACHINERY.—The cost of moving the Mammoth 40-stamp quartz mill from the old camp to Aurora will exceed $12,000. The mill is said to be complete and the transportation of the same to Mammoth City, its present site, cost about $150,000. The expense of bringing the Bulwer-Standard mill into Bodie was $90,000, so it will be seen that although one may feel convinced of untold wealth in a mine it takes confidence and nerve to even ship the necessary machinery into the country for working. The shipment of the Mammoth mill to Aurora will be significant of the faith in the old camp and its prosperity in the near future. Superintendent Holt accompanied Penter's teamster in the examination of the condition of the road to approximate the cost of transportation.— *Bodie Free Press.*

CALIFORNIA MACHINERY FOR COLORADO.—Yesterday two cars of machinery for mines at West Cliff, Colorado, passed here. This machinery was made at San Francisco, a fact which shows that mining machinery made on this coast is considered superior in Colorado to that made East.— *Winnemucca Silver State.*

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

HAND PIECE FOR DENTAL ENGINES.—Henry S. Grace and Wm. A. L. Miller, S. F. No. 303,723. Dated Aug. 19, 1884. This dental implement consists of a plugger and a boring-tool in a single dental hand-piece, and, in combination therewith, of a mechanism by which either part may be put into operation while the other remains inactive. This invention is a very important one and the internal mechanism is quite ingenious.

TUCKER FOR SEWING MACHINES.—Albert J. Hart, San Francisco, assignor of one-half to John Yule, Oakland. No. 303,511. Dated Aug. 12, 1884. This tucking attachment to sewing machines consists in certain combinations of devises. The object of the invention is to provide a single and effective tucker which shall operate accurately, and receive the goods with the tucked portion always on top in sight, whereby the various adjustments can be readily made.

ADJUSTABLE BEAM-WHEEL.—John W. Stafford, Acampo, San Joaquin county. No. 303,405. Dated Aug. 12, 1884. This adjustable wheel is for the beam of single plows and other agricultural implements on which such wheels are used; and the invention consists in a wheel peculiarly mounted in the lower end of a pivoted lever which is connected with an adjustable rack secured to the beam. By the movement of the lever on its own pivot, acting against the wheel as a fulcrum, the beam is raised or lowered, and by the side adjustment of the rack the wheel is thrown under or to one side of the beam, while by another adjustment the rack may be made to fit different beams.

REAMER.—John C. W. Wilson, East Portland, Or. No. 303,410. Dated Aug. 12, 1884. This invention relates to a new and useful reamer or boring tool for turning work and for boring, and it consists in a stock having a conical point; a tubular casting or hollow nut threaded upon the end of said stock, and having independent radiating studs loosely seated in it, and projecting outwardly. The conical point of the stock enters between the inner ends of the studs within the hollow nuts as said nut is set up and forces them outwardly to bind upon and fix the ring, or other work to be turned. The object of the invention is to provide a simple and effective reamer or boring tool.

ELEVATING APPARATUS.—Ira Bishop, S. F. No. 303,384. Dated Aug. 12, 1884. The special object of this elevating apparatus is to carry sacks or bags of material (such as grain) from a lower plane and deposit them on a higher plane—a result necessary to be accomplished in grain warehouses, when the sacks have to be elevated to the floor above, or to the top of a pile on the same floor. This invention is an improvement on a similar piece of mechanism previously patented by the same inventor. The invention consists in an endless chain belt or carrier having peculiar sack hooks or rests, and operated by means of a suitable driving mechanism upon a portable frame, to which are attached, top and bottom, adjustable receiving and discharging aprons.

SAFETY CAR-TRUCK.—Jeanty Denechand, S. F. No. 303,713. Dated Aug. 19, 1884. The invention relates to a new and simple safety car-truck of that class in which a suitable arm or arms are mounted under the car and are adapted to be moved by suitable mechanism in such a manner as to insert guard-rollers, which are mounted in their ends into the grooves in the rails, or to withdraw them therefrom. It consists in a single rigid arched arm carrying rollers in its ends and mounted under the truck and in suitable mechanism by which said arm is lowered and raised to extend transversely and insert its rollers in the grooves of the rails, and by which it is turned again to withdraw its rollers, and is raised to a position parallel with and above the level of the rails. The object is to prevent the de-railment of the car.

STAIRS FOR BUILDINGS.—Peter H. Jackson, S. F., No. 302,339. Dated July 22, 1884. This invention is specially applicable on stairs, on which the treads and risers are made of iron, either plain or with openings of glass for illuminating. It consists of risers, so constructed as to form deep vertical beams, supported at the ends only, of treads, extending from the top of one riser to the foot of the next, with means for securing two together, to resist the tendency of the riser to turn under heavy loads, a means for supporting the central portion of the treads and risers, and in certain details of construction. In the construction of building-, especially where the basements and basement extensions are used for business purposes, when stairs pass up over the front of the basement it is necessary to so construct the stairs as to leave the greatest amount of space beneath them, so that, when desired, illuminating tiles may be set into the stairs to furnish light to the basement with the least possible obstruction. In order to do this, it is necessary to build such without any support or beams underneath. This is the object of the present invention.

MECHANICAL PROGRESS.

Stiffness in Shafting.

It is a common error among builders and users of machinery, both heavy and light, to suppose that because shaft bearings and similar parts appear to be rigid, and to be properly held to place, that therefore they really are thus kept and held. An amount of bending or yielding which is by far too small to be measured, or even detected, by ordinary means will prove in many cases, enough to disturb seriously the supposed working conditions of the parts of a machine, and to lead to heating and cutting which is sometimes persistent and baffling in the extreme.

Probably the chief reason why this is so arises from the fact that, by the springing or slight yielding of the foundation of the pillow-block or hanger in which a shaft may be held, the pressure due to the work transmitted is thrown upon quite a small part of the surface upon which it was intended to be borne, so that the chance is greatly multiplied that the lubricating material will be pressed out from between the surfaces, and that the co-efficient of friction will be thus increased to a degree entirely beyond a safe limit, if indeed the surfaces, becoming dry, do not cut and badly tear each other.

Obviously the first thing done when a bearing begins to heat, is to put on more lubricating material, although care is not always taken to see that it goes where it is needed, or that it is a right kind. The change in the condition of the parts is in the wrong direction in both the particulars upon which the proper running of the whole depends, viz: the co-efficient of friction and the pressure between the surfaces, the pressure being increased by the springing of the parts, and the ratio of the friction being increased by the tendency to crowd out the oil or tallow used.

If it were clearly understood that mere flexibility in machinery, as the term is often used, does not necessarily mean a correct ease of motion, there would be a good deal gained in the interest of economy and of efficiency although these two words mean very much the same thing. It is customary to speak of the "limbering" up of a machine by or during the first few days that it is run, but this word may have two very different meanings. One is, that until all the moving parts have become thoroughly oiled and polished, as they only can be by actual working, they should be held in place loosely, all the binding bolts and adjusting screws being left slack for the purpose. The other meaning, often very incorrect or injudicious in its application, implies that little or no exact workmanship need be used in the fitting or erection of the machinery so long as things are left loose to "find their bearings," as the term is, the misfortune really being that most things, when thus left to themselves, are likely to move out of correct adjustment as well as to remain in it, the usual result of any actual working being to cause a loss of accuracy from the first. Hence the bearings usually "found" by such slackened machinery are not the ones in which the parts should remain, whether they were correct in the first place or not. Nothing can possibly take the place of solid, unyielding foundations for securing permanent economy in the working of any machinery, and no "limbering up" can serve any useful purpose unless this slackening be at the same time accompanied by the closest watching to guard against a loss of accurate level or lining. This is the more important when light shafting or kindred parts are involved, for, as a rule, the lighter the shafting the greater is the proportion of the total power of the engine which is consumed in driving it, as compared with the more massive machinery in the larger mills.

A NEW BLOWING LAMP.—An English firm is now introducing a new blowing lamp for blowing joints, burning off paint and loosening metallic joints when set with corrosion, and more especially for putting india-rubber tires on bicycles and tricycles. The novel part of the lamp consists of a cylinder with two pipes, one telescoped over the other. One of these pipes—about one and three-fourths inches long—is attached to the top of the cylinder, and has a very fine jet formed upon its upper end. The other and longer tube, which slips closely over the fixed pipe, has two lateral openings, through which a proper admixture of air with the gas takes place, so as to obtain a pure blue flame, and around the bottom end of this pipe a small saucer is formed to hold spirit for starting the flame. When in use the cylinder is filled with pure benzine, and then the saucer nearly filled with methylated spirit. When this is ignited, sufficient heat is conveyed to the cylinder to cause a stream of spiritous vapor to issue from the orifice with considerable energy, when it at once becomes ignited by the flame from the methylated spirit in the saucer, and can be applied as desired. The lamp is claimed to be much safer than the French blowing lamp, as, unless the aperture for the escape of the vapor is open, there is no heat by which fresh vapor can be generated, and an explosion from this cause is therefore impossible.

A NEW STEEL MAKING PROCESS.—One of the latest modifications of the Bessemer process for making steel is that of Mr. Alfred Davy, of Sheffield, Eng., and it is likely to prove of great value. The invention consists in employing, with a portable vessel, stand pipes adapted to discharge air into the metal in the vessel beneath the surface by pipes dipping in from above, thus enabling cast-iron founders to make steel and steel castings without the costly plant now provided for this purpose. Mr. Davy claims that his apparatus will enable every iron founder to produce large or small quantities of steel for castings or other purposes at about the cost of cast-iron, and of a quality superior to most crucible steel used for castings. It is claimed, also, that steel may be produced by this apparatus of any temper or quality, except, perhaps, the highest quality of tool-steel, in large or small ingots, at $20 or $22 per ton. The cost of the apparatus is small as compared with the Bessemer plant, and its working is so simple that it can be managed by any ordinarily intelligent workman. Three or four plants for the manufacture of steel by this method have been ordered for this country, and in Sheffield no less than 24 sets of plants are being removed to make way for Mr. Davy's apparatus. The amount of Bessemer steel produced in the United Kingdom in 1878 was 807,527 tons, but in 1883 the production amounted to 1,553,330 tons. The Davy apparatus has already been described in a previous issue of this paper. *W. Manufacturer.*

DRESSING MILL PICKS.—A correspondent of the *Blacksmith and Wheelwright*, writes that journal in regard to the manufacture and dressing of the mill pick as follows: "I will say first that they should be made of double refined cast-steel made expressly for this purpose. In drawing out, use a smooth face hammer, and be careful not to heat the steel higher than a dark cherry red. Do not strike the pick on the edge when finishing it, but hammer on the flat side, striking light and often, until the steel is quite dark. Let the blows fall so as to close up the pores of the steel. When a dozen picks are ready to temper get one pound of the best concentrated lye, which will cost only a dime in any store. Dissolve it in a bucketful (a common water bucket) of soft rain water, then heat the point of the pick to a cherry red dip the point vertically into the bath and hold it still. When the heat has left the parts immersed take it out, draw to a light straw color and cool in a tub of clear water. Be sure to have the lye well dissolved and stirred up before tempering. Also be sure to heat and hammer well. Follow these directions and you will find no trouble in making picks stand on the hardest French buhrs."

THE COMING BOILER.—An exchange says: "The coming boiler will be made of steel, and iron will be the exception, as it is now on all first class railroad lines. After twenty-five years of experiment, a discovery has been made which brings the working of any grade of steel within perfect control. By the Bessemer desulphurizing process steel of an extraordinary degree of softness can be obtained with the greatest facility at a cost that is less than is paid for ordinary steel rails. Till now the high price of soft steel has been the great obstacle which has prevented many people from using it in construction. But, by the new process, soft metal can be produced at a less price than ordinary puddled iron. There is, therefore, no longer any reason why steel should not be everywhere employed in place of iron, to which it is so much superior in strength. Indeed, 200,000 tons of steel were made yearly in England, and 500,000 on the continent, according to the reports, and by this time it is quite likely the capacity is doubled. *-Ex.*

SODIUM BRONZE, A NEW ALLOY.—Q. L. Weiller, Angouleme, France, has patented in England, France, America and Italy a new alloy for making silicious copper and bronze. The alloy is claimed to be particularly suited for electric conducting wire, and also for making guns and machinery. A mixture of sodium and tin is first made, after which copper is added to form what the inventor calls "sodium bronze." When a larger amount of sodium is required than can be conveniently combined with the tin to be employed in the alloy, sodium in an uncombined state can be used in conjunction with the sodium-tin or sodium-bronze, the product being introduced with fluosilicate of potash into the melted copper or bronze.

PROGRESS OF AGRICULTURAL MACHINERY.—The inventors and makers of agricultural machinery have devoted so much ingenuity upon their work that it is hard to conceive any ordinary operation in farming that is not facilitated by some labor-saving machine. From the time that wheat goes into the ground till the time it reaches the table in the form of bread, nearly every separate process has been done by machinery. We know of no field of mechanical enterprise where labor-saving appliances are receiving the same attention at present as they are in agricultural machinery establishments.

A VALUABLE BUILDING STONE.—A peculiar kind of building stone is found in some localities in Oregon, which, it is said, possesses the property of being uninjured by the action of cold, heat and moisture. It is called granite sandstone, is very rich in silica, of a close, fine grain, highly crystallized, unlaminated and of a fine brown color. On being brought to a white heat, and suddenly plunged in cold water, it comes out as solid and firm as at first.

SCIENTIFIC PROGRESS.

Progress of Chemistry.

At the recent Montreal meeting of the British Association for the Advancement of Science, Prof. Henry Enfield Roscoe, President of the chemical section, made an address in which he reviewed the progress of the science between 1848 and 1884. The first date is that of the death Berzelius. The second that of Dumas, the chemist. The differences between what the speaker called the Berzelain era and that with which the name of Dumas will be associated show themselves, he said, in many ways, but in none more markedly than by the distinct views entertained as to the nature of a chemical compound. According to the older notions, the properties of compounds are essentially governed by the qualitative nature of their constituent atoms, which were supposed to be so arranged as to form a binary system. Under the new ideas, on the other hand, it is mainly the number and arrangement of the atoms within the molecule which regulate the characteristics of the compound, which is to be looked on not as built up of two constituent groups of atoms, but as forming one group. After discussing valency or the doctrine of atomicity the speaker took up that interesting phase of organic chemistry known as orientation.

This brings up the question: Given certain compounds which possess the same composition and molecular formulæ, but varying properties, to find the difference in molecular structure by which such variation of properties is determined. Problems of this kind can now be solved satisfactorily, the number of possible isomera forctold, and this prediction verified by experiment. The general method adopted in such an experimental inquiry into the molecular arrangement of chemical constitution of a given compound, is either to build up the structure from less complicated ones of known constitution, or to resolve it into such component parts. In connection with this matter Prof. Roscoe remarked: "The discovery of aniline colors by Perkin, their elaboration by Hoffman, the synthesis of alizarin by Graebe and Liebrmann, being the first vegetable coloring matter which has been artificially obtained, the artificial production of indigo by Baeyer, and, lastly, the preparation by Fischer of kairinc—a febrifuge as potent as quinine—are some of the well-known recent triumphs of modern synthetical chemistry. And these triumphs, let us remember, have not been obtained by any such 'random haphazarding' as yielded results in Priestly's time. In the virgin soil of a century ago the ground only required to be scratched and the seed thrown in to yield a fruitful crop. Now the surface soil has long been exhausted, and the successful cultivator can only obtain results by a deep and thorough preparation, and by a systematic and scientific treatment of his material."

GASES IN STEEL—Brastlein concludes, from a great number of observations, that iron and steel can be alloyed with nascent hydrogen at ordinary temperatures; but at a red heat this alloy is broken up, and that at the melting temperature of steel it may again be alloyed with hydrogen with more or less energy.

Will North America Become a Desert?

This is a startling query which has been suggested by a recent writer in the *North American Review*. The source of the threatened danger is expected from the gradual change wrought in our climate by the diminution of rain-fall, caused by the denudation of forests and other matters following in the train of advancing civilization. By reason of extensive land cultivation and forest destruction the rivers are slowly drying up, and extended droughts are much more frequent than formerly, while the winter snows and spring rains are carried away more rapidly than formerly.

Some notable statements are presented in support of these assertions. In various sections of the country where perennial springs were once numerous they are now rare; in localities where crops were once easily raised they are now seriously interfered with by drought; rivers which once furnished an abundance of mill power now often fail to turn the wheels for lack of water.

The ultimate issue is foreshadowed from the experience of the old world. Historians of antiquity describe what are now great barren regions in Asia Minor and Northern Africa as in their time teeming with verdure. Babylonia was once a delightful country. It is now almost a desert. The temperature is also changing from the same causes in many localities. Notable changes are observed in Babylonia, Northern Greece and Italy, Germany and Spain. All these changes have been wrought by the hand of man in the progress of civilization. The same causes are now at work in regions where the advent of civilization has a later date, and these appear to be full enough of probability that the same changes will occur on this continent unless science steps in to show how to avoid it, and legislation comes to her aid to compel a course of improvement which will prevent such undesirable changes in the face of nature.

BALLOON PHOTOGRAPHY.—Major Eleslade has lately made some interesting experiments upon balloon photography for military purposes. He launched at Chatham captive balloons provided with automatic photographic chambers. After the balloon reached a certain hight the plate was exposed and a negative taken. The experiments are said to have succeeded perfectly, and in one of the small proofs obtained in this way the number of soldiers placed at a great distance could be ascertained by counting, with the aid of a magnifying glass, the little white spots which were made by the helmets of the infantry. *-Nature.*

OBSERVATIONS ON THE STAR ARCTURUS.—The astronomers at the Greenwich observatory have been making calculations as to the speed of the star Arcturus in his progress toward the earth. They find, as the result of 21 observations, that this beautiful, scintillating star is moving toward this planet at the rate of 50 miles per second. This amounts to about 3,000 miles a minute, or 180,000 miles an hour. But, even if this hot rate of speed should be continued, Arcturus is not likely to shatter our little globe for the next 93,000 years, although his brightness is likely to grow in the sight of remote posterity. A scientist, writing on this subject, says that an 81-ton gun will drive forth its projectile with a maximum velocity of 1,400 feet per second, and that Arcturus is approaching us at a speed 200 times greater. But, as the earth's distance from this lively star at the last measurement was estimated at 1,622,000 times greater than that between it and the sun, this generation and untold generations to follow may pursue the even tenor of their way undisturbed.

ORIGIN OF VOLCANIC ACTIVITY.—Few persons doubt at the present day, that the elastic force of steam is the true motor of volcanic eruptions and earthquakes. The ocean is the source of the water which reascends to the surface through volcanic crevices. Since the pressure developed at great depths is the cause of the eruptions, it is obvious that the water can not penetrate through cavities of sensible dimensions. Stanislas Meunier in speculating upon this matter, supposes three successive layers of rocks, under the ocean bed; the first of rocks impregnated with water, the second of rocks consolidated without the impregnation of water, and the third of rocks in which the temperature is sufficient both to vaporize and to dissociate the vapor of water. The water penetrates farther and farther into the deep rocks in consequence of the secular cooling of the globe, and the rupture of portions of the earth's crust by the contraction of the internal nucleus admits the water of the superficial layers into regions in which the vaporization and dissociation suddenly takes place.—*Nature.*

UTILIZING CORN HUSKS.—The husks of maize or Indian corn, after the grain has been extracted, usually serve only for manure, or, in some cases, as fuel for portable engines for agricultural purposes. But they contain starch, alhumen, and other substances capable of being turned to account, and even afford an alcohol which is at least equal to potato spirit, leaving a pulp suitable for the food of various animals. Herr Holl, of Worms, has invented a process for utilizing these husks, by which he exposes the husks for an hour or an hour and a half to the action of steam at a pressure of 35 to 45 pounds per square inch, in order to reduce them to powder, and thus open the starch cells, when distillation is proceeded with in the ordinary manner.

MEETING OF THE BRITISH ASSOCIATION, MONTREAL.—It is now 53 years since the British Association for the Advancement of Science was formed, principally through the efforts of Sir David Brewster, Sir Humphry Davy, Sir John Herschel, and other leading scientists. The main feature of the association is its annual gatherings, at which members who suppose they have made a real advance in science read their papers for the criticism of others engaged in similar lines of scientific work; reports are also made upon particular departments, their progress and needs, and as a guide to further inquiry. This year, however, affords the first instance of the meeting of the association outside of the British Isles.

ATMOSPHERIC ELECTRICITY AND THE WEATHER.—The Providence *Journal* states that the recent experiments undertaken at Harvard College to test the value of electrical changes in the atmosphere as indications of coming weather changes have been very promising. Though the observations are not yet full enough to justify decided statements, "coming changes in the direction of the wind, rainy weather and coming storms," it says, "are foretold by the apparatus." The apparatus employed, which is substantially that devised by Sir William Thomson, with some adjustments, photographs every change in the electricity of the air, and also indicates the degree of change.

EFFECT OF ZINC ON WATER. In Guy's Hospital Report, Dr. Stevenson alludes to a generally accepted opinion, that water stored in zinc or zinc coated tanks is not affected by the zinc to any appreciable extent, and states that he has abundant evidence that water does, under certain conditions, act energetically upon zinc and galvinized iron. He mentions a case in which rain water passing from a reservoir through galvanized pipes was for many weeks turbid and milky in appearance, and contained a notable quantity of zinc in suspension, and some in solution. Dr. Stevenson's experience is also confirmed by that of other writers.

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Passing Events.

Mining matters are exceedingly quiet just now. The approach of winter has brought in the prospectors from the more mountainous regions, where, in some places, snow has already fallen.

Judging from the late Montana papers, the reports as to the richness of the new Little Rocky mines, seem to be confirmed. Hundreds of men have gone to the new diggings from the towns about the region, and some of the first on are said to be getting handsome pay. Both placer and quartz are found, the gulch in which the placers have been discovered being quite extensive.

Arizona announces a Territorial Industrial Exposition, which is but another proof of her advancement.

The State fair at Sacramento is in full blast and is largely attended.

A SPECIAL from Cincinnati says: The discovery of tin in West Virginia is attracting much attention. When first found it was supposed to be silver. It is estimated that the veins are sufficiently extensive to supply a dozen furnaces for hundreds of years. The owners of the land expect to begin operations on a large scale. This is the first tin discovered on the Atlantic coast.

An Exhibition of Inventions.

An international exhibition will be opened next May, at the buildings in South Kensington, which will be devoted to apparatus, appliances, processes and products, invented or brought into use since 1862. The collection of inventions will, it is hoped, serve to bring vividly before the public the progress which has been made during the last quarter of a century, in applying the discoveries of science to the purposes of daily life. For the practical realization of this idea, it will be desirable not only to exhibit the apparatus by which a process is carried out (or a model or diagram of it), side by side with the resulting product, but also to show the working of, at all events, a limited number of industrial processes in their consecutive stages. Having in view the wide range of this international exhibition, and the limited nature of the total available area, it will be necessary to restrict as much as possible the amount of space which can be allotted even to the most important classes. It will be preferable that inventions generally should (as far as practicable) be illustrated by models, which, in the case of an entire machine, may be accompanied by actual examples of the parts improved. Where the invention relates to parts only of a machine, the whole machine will not be admitted unless the improvement (in respect of which the machine is offered for exhibition) cannot be sufficiently well shown without the exhibition of the entire apparatus, or unless in the opinion of the executive council the exhibit is of such special interest as to render its admission desirable. As the exhibition will be limited to the illustration of industrial processes, examples of either the raw materials employed, or the finished products will only be admitted when they are required for the full demonstration of a particular process. Applications for space from this county will be received up to November 1st.

Here is an opportunity for American inventors to show their inventions in the most thickly settled portion of the world, and to an appreciative multitude. There are very many of our processes, products and appliances, not now known abroad, which could be successfully introduced through the medium of this international exhibition. Our American inventors should be up and doing in this direction. It will be well for them to patent their inventions in England before exhibiting them, if they have not already done so. But, at all events, our inventors should take steps to be properly represented. The classification is as follows: Apparatus, Appliances, Processes and Products invented or brought into use since 1862.—Agriculture, horticulture and arboriculture; mining and metallurgy; engineering construction and architecture; prime movers and means of distributing their power; railway plant; common road carriages, etc.; naval architecture; aeronautics; manufacture of textile fabrics; machine tools and machinery; hydraulic machines, presses, machines for raising heavy weights, weighing, etc.; elements of machines; electricity; apparatus, processes and appliances connected with applied chemistry and physics; gas and other illuminants; fuel, furnaces, etc.; food, cookery and stimulants; clothing; jewelry; leather, etc.; India rubber and gutta percha, etc.; furniture and accessories (fancy goods); pottery and glass; cutlery, ironmongery, etc., fire-arms (military weapons and equipment, explosives); paper, printing, book-binding, stationery, etc.; clocks, watches, and other timekeepers; philosophical instruments and apparatus; photography; educational apparatus; toys, sports, etc.

FOREIGN CORPORATIONS.—In the case of M. O. Thomas vs. The Placerville Gold Quartz ing Mining Company, the Supreme Court has denied the motion for a change of venue from San Francisco to El Dorado county. "A foreign corporation," says the Court, "exists in and by virtue of the law of a foreign country and no statute of this State has ever given a local (county) residence to such a corporation, where alone it can be sued. Its liability to be sued in the Courts of this State no more confers a county residence upon it than does the comity which permits it to apply to our Courts for the enforcement of a contract or the redress of a wrong."

THE Miners' Union of Battle Mountain has elected the following officers: President, Bart Malloy; Vice-president, Arthur Thomas; Secretary, P. H. Boland; Treasurer, E. J. Harris.

Mill Sites.

Section 405 of the U. S. laws provides that "where non-mineral lands not contiguous to the vein or lode is used or occupied by the proprietor of such vein or lode for mining or milling purposes, such non-adjacent surface ground may be embraced in an application for a patent for such vein or lode, and the same may be patented therewith, subject to the same preliminary requirements as to survey and notice as are applicable to veins or lodes; but no location on such land shall exceed five acres, and payment for the same must be made at the same rate as fixed for the superficies of the lode. The owner of a quartz mill or reduction works, not owning a mine in connection therewith, may also receive a patent for his mill site."

To avail themselves of the provisions of this law, parties holding the possessory right to the vein, and to a piece of non-mineral land near by, not exceeding the required quantity, the proprietors of the same may file in the proper land office their application for patent, under oath, which application (with plat and field notes) may embrace the mill site in addition to the lode, and after due proceedings the patent will issue conveying it as one claim.

The Land Office requires that in making a survey in a case of this kind the lode claim should be described in the plat and field notes as ("Lot No. 37 A.), and the mill site as ("Lot No. 37 B"), or whatever may be its proper number; the course and distance from a corner of the mill site to a corner of the lode claim to be invariably given in the plat and field notes, and a copy of the plat and notice of the application must be posted for 60 days on both the mill site and the vein. In making the entry no separate receipt or certificate need be issued for the mill site, but the whole area of both lode and mill site will be embraced in one entry, the price being $5 per acre.

In case the owner of a quartz mill or reduction works is not the owner of a vein, the law permits him to make application in just the same manner as provided for mining claims; and after the notice, in the absence of valid adverse filing, he will receive his patent for the mill site. In every case there must be satisfactory proof that the land claimed as a mill site is non-mineral, which proof may, where the matter is unquestioned, consist of the sworn statement of the claimant, supported by that of one or more disinterested persons, capable, from acquaintance with the land, to testify understandingly. The law expressly limits mill site locations to five acres.

An Arizona Industrial Exhibition.

The Arizona Industrial Exposition Association will open their first fair on November 10th, at Phœnix, Arizona. It will continue six days. Word from all parts of Arizona, from stock and mining men, assure the Association of a great deal of interest in this first fair. The S. P. R. R. offers free transportation from all points in Arizona, and half rates on California and New Mexico exhibits.

This will afford a fine chance for manufacturers in this State to advertise their machinery—farming, fruit, mining and household appliances. Silver and bronze medals and diplomas will be offered as prizes for exhibits. They have a regulation mile-track which is being put in fine condition for racing.

There are many things we make in this State which are used in Arizona. Our merchants and manufacturers who are anxious for the Arizona trade should make an effort to be represented at this fair in some way. Heavy articles, expensive to transport, handle and set up, perhaps it would hardly pay to send so far, although if there is a market for them in this growing Territory they ought to be shown. But there are many things which should be exhibited. No doubt suitable persons could be found on the spot to take charge of exhibits. A good deal of Arizona trade is now done by Los Angeles people which formerly came to this city, and exhibitions such as this furnish one of the means for San Francisco firms to secure their portion of the growing trade.

MR. H. A. BEATON is now visiting Washington Territory in the interests of this and other papers published by Dewey & Co. We shall feel obliged to all who can assist him in any way in obtaining information, and increasing our list of subscribers in the Territory.

A Mining Debris Case.

Patrick Campbell, the former superintendent of the Golden Gate Consolidated Hydraulic Mining Company, situated near Smartsville, Yuba county, appeared in Judge Toohy's Court this week, seeking to secure his release from the custody of the Yuba county officials, on a writ of habeas corpus, he having been committed for contempt of Court by Superior Judge P. M. Keyser. It appears that on February 1, 1883, suit was commenced by the people of Yuba county against the mining company, of which the defendant was superintendent. An injunction was issued by Judge Keyser, restraining the officers, agents, or any of the employes of the mining company from dumping or allowing debris from the mine to run into the Yuba river, or any of its tributaries, and Sucker flat ravines. A summons was duly served on the company on September 15, 1883, and on December 12th of the same year, James Redmond and E. A. Davis appeared in Court before Judge Keyser, and averred that on the first of that month Campbell had worked the mine and allowed the tailings to run into the Yuba river. On January 24, 1884, an order was made citing Campbell to appear in Court on March 3, 1884, to show cause why he should not be punished for contempt in violating and disregarding the injunction. Campbell was in this city at the time and he did not personally appear in Court, but was represented by his attorney. The result of the matter was that Campbell was found guilty of contempt and ordered to pay a fine of $500 or be imprisoned in the Yuba county jail for 500 days. As he did not pay the fine, an order for his arrest was made on the 20th of uly, and he was arrested in this city by Detective Harry N. Morse, to be returned to Yuba.

Campbell's lawyers argued that he should be released on the ground that he was not connected with the company at the time that the injunction was issued, and consequently the restraining order did not apply to him. T. P. Reardon, the former president of the company, testified in support of the motion that Campbell had severed his connection with the company two months previous to the issuing of the injunction, and had not been interested in the mine in any manner since that time. Campbell then corroborated Reardon's testimony, and the matter was taken under advisement until the 8th prox.

The Lick Observatory.

Prof. Holden, of the Washburn Observatory, Madison, Wis., has come to California to set up the repsold meridian circle of the Lick Observatory, Mt. Hamilton. This meridan circle has been made by designs by Prof. Holden with improvements in details suggested by his use of the first one, and is believed to be the first instrument of its kind in the world. The objective is six miles in diameter with No. 5 collimeters of the same aperture. The circles are graduated to two minutes and the errors of graduation are less than half a second.

The instrument will be placed on the northeast angle of the plateau of Mt. Hamilton, from the summit of which 40,000 tons of material were removed.

A large amount of the preliminary work at Mt. Hamilton has been completed, under the personal supervision of Thos. E. Fraser, superintendent of construction of the Lick Observatory. Steady work is being carried on in preparation for the great telescope. Bad luck in casting the glasses has delayed the completion of the instrument, but the Lick Trustees will eventually furnish one of the finest observatories in the world. The location is a most excellent one, the atmosphere being generally clear at the point selected, and little trouble is anticipated from coast fogs. Numbers of visitors go to Mt. Hamilton now to inspect the buildings and site.

MONTANA ASSAYERS.—The developing mineral resources of Montana at Butte City are causing much work for assayers, and some thorough and competent workmen in this line are to be found about the laboratories of the smelting works and mines of that place. Hubbard, Breen & Meade have a chemical laboratory and assay office in town, where they recently showed our agent many interesting processes and results. The ores at Butte in many instances carry so many metals that a very thorough assay is necessary to determine their value. It is well that there are places where the prospector and miner can learn these values right at home.

The Hotchkiss Mechanical Boiler Cleaner.

The engravings herewith illustrate the Hotchkiss mechanical boiler cleaner, for removing sediment or mud from steam boilers. Fig. 1. shows the cleaner as applied to ordinary boilers; Fig. 2. shows it in all parts. Referring to Fig. 2. A A is the top of the boiler upon which reservoir B rests; this reservoir is connected with funnel C by up-flow pipe D, and to the lower part of the water by return pipe E. The funnel C is set within the boiler on low water line O O. G, is a diaphragm in the reservoir, to divert the flow of the water therein. The spot shown at the top of the diaphragm in the reservoir is an airhole, and must not be plugged. F is the blow-off pipe for removing deposits in the reservoir. H H are two valves to shut off the reservoir from the boiler in case it is desired. I is the valve in the blow-off pipe F. K, socket nipple with thumb screw to make joint between funnel and up-flow pipe. M and N, nipples with half union to make joints with valves H H. Pipes and fitting are one and one-half inch, except the blow-off pipe, for which one inch pipe and fittings are used. The blow-off pipe can be carried to any desired place as occasion requires, but the valve should not be placed on top of the boiler, but in the handiest place possible; this, in order that it may be used without inconvenience.

The manner in which the cleaner acts in removing sediments and preventing scale formation is as follows: As soon as the water in the boiler becomes heated, currents are established, formed by the hotter and therefore lighter water flowing upward and away from the source of heat, while the colder, more dense water flows towards the source of heat to replace the other, in its turn to become heated. This action is constant and certain. These currents carry to the surface of the water sediments held in suspension. The sediments that are held in solution are separated from the water at the point at which steam is formed, viz., the surface of the water. Thus sediment held in suspension and in solution collects on the surface of the water. In a boiler with the cleaner attached, the funnel is set at a point furthest from the fire, near the surface of the water, but partly submerged, and in such a position that its opening will intercept the currents of hot water flowing toward it. By the action of gravity in waters of varying temperatues, aided by the pressure of steam on the surface, the hot surface water that enters the funnel is forced into the reservoir through the up-flow pipe, displacing an equal quantity of cooler water therein, which flowing back by the return pipe, reaches the lower and cooler strata of water than that entering the funnel. Thus a constant and steady circulation of water through the cleaner is maintained so long as firing is kept up. This circulation is continuous and automatic, and by a certain and natural action all the water in the boiler passes successively through the reservoir, where being kept from the agitating currents in the boiler, the most favorable conditions are insured for deposit of sediments.

Sediments are removed from the reservoir through the blow-off pipes as often as necessary. Every one familiar with steam boilers is aware that deposits seek naturally the quietest part of the boiler. The object of the Hotchkiss cleaner is simply to provide a place for their accumulation outside of the boiler, removed from the heat and its agitating effects, from whence they can be readily removed as fast as they accumulate without having to shut down the boiler and clean them out, or without blowing down the boiler in the usual way, using a large amount of water already heated to the steaming point, which is wasteful of fuel as well as of water.

It is not claimed that the Hotchkiss cleaner will remove scale already formed bodily, but it is claimed that it will prevent the formation of new scale by removing all the deposits, whether held in suspension or solution, that the water contains, before they can adhere to the heating surface. By preventing new scale from forming, the old scale, by expansion and contraction of the heating surfaces, soon becomes loose, and is easily detached. The cleaner is automatic and certain in its action, and will outwear a new boiler. It requires no attention, care or expense beyond the cost of application. The apparatus requires no attention, acting automatically. It is claimed that it will not only save cost in repairs and fuel in a few months, but will reduce the liability of explosion. Very many of these appliances are in use. In the vicinity of this city the sole agents, Messrs. Cavanaugh & Fredricks, 317 Mission street, will apply it complete for $125. Where parties wish to apply it themselves, the special fittings, including everything except the 1½ inch circulating pipes (D and F), about 8 feet long, and the 1-inch blow-off pipe (F), will be supplied for $100, free on board cars.

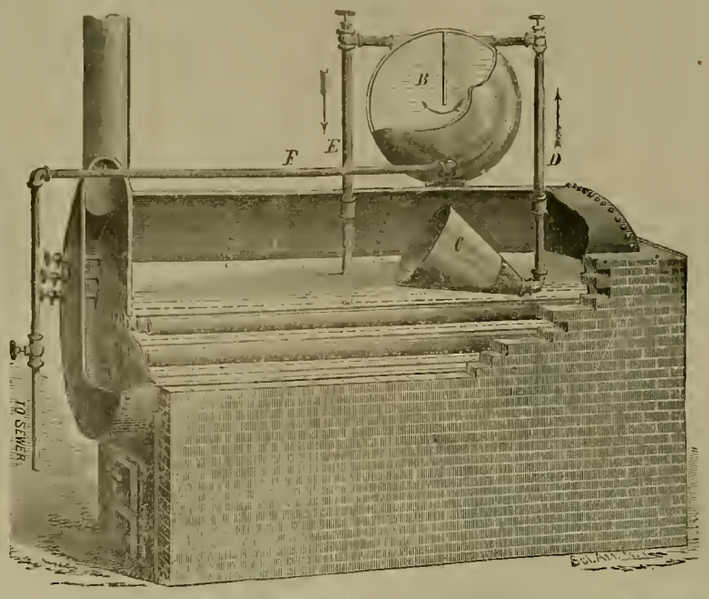

Fig. 1.—THE HOTCHKISS CLEANER AS ATTACHED TO ORDINARY BOILERS.

MINERAL CABINET.—Probably one of the most remarkable cabinets of mineral specimens in Montana, if not the finest private cabinet on the coast, is that belonging to Geo. W. Newkirk, at his place of business, Butte City. He has choice and valuable specimens from all the Territories and States on the coast, including Colorado and also Alaska, as well as rarities in the shape of silver and gold coins, specimens of the handiwork of natives of various tribes, freaks of nature in queer formations, rara avis, etc. The Villard excursion party, which came on to witness the driving of the last spike in the N. P. R. R., took a run down to Butte City, and besieged Mr. Newkirk in a body. They expressed great surprise at his rare collections, as has been done by many a Pacific coast tourist who may take the trouble to look at it. One or two of the gold quartz specimens show how Nature excels as a jeweler when she essays to attain the beautiful. The threads of gold running through the white quartz, and the filagree work where these threads are matted together are the hights of beauty in the combination of stone and metal.

Electricity for Hauling Cars Underground.

On the continent the mining engineers have been quick to perceive the advantage which might be derived from the employment of the electric current for power underground. After numerous experiments, about two years ago the electric system of hauling cars underground was put in service at the Zankeroda mine, in Saxony, and since that time it has been in constant operation. The plane which is worked by electrical haulage is a stone-drift connecting two distant parts of the mine. This drift is about 225 yards from surface, and is 730 yards in length and perfectly straight. Laid out to be worked by steam or by horse-power, it would offer very favorable conditions for economical haulage. It is laid with a double line of rails of 19-inch gauge, one line being set apart for the loaded tubs and the other for the returning empties. The rails are of the Vignoles type, and weigh 14 pounds per yard. The electric haulage is limited to 630 yards, about 50 yards at each end of the drift being left for space to make up the trains. From a mechanical point of view this line has been a complete success from the day it was opened, now more than two years since. Throughout that period of time no hitch has occurred in the working and no skilled attendance has been required.

Mr. George J. Andre, the accomplished writer and mining engineer, in his "Continental Colliery Notes," which he is publishing in the Manchester *Colliery Guardian*, gives some very interesting details of results with other systems, from which we condense some facts.

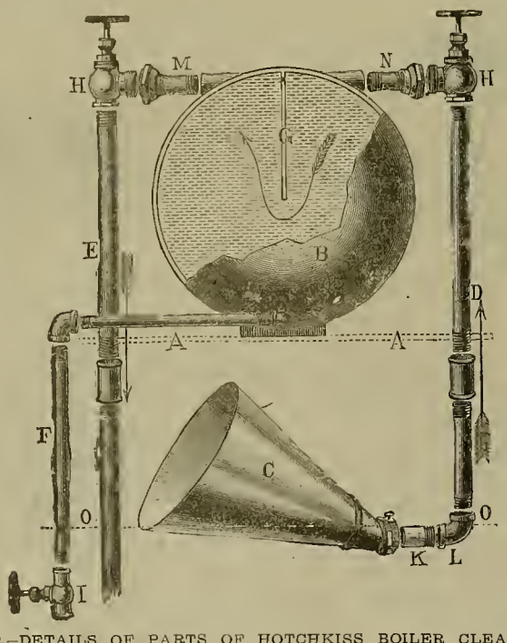

Fig. 2.—DETAILS OF PARTS OF HOTCHKISS BOILER CLEANER.

The engine house at surface in which is the electrical machine is situate about 64 yards from the shaft. The machine is one of the Siemens' construction, and is driven by belting from the engine at a speed of 800 revolutions a minute. This speed is three and a quarter times that of the motor underground. A carefully conducted series of experiments shows that this ratio of the speeds gives the highest efficiency. The current is carried from the machine to the shaft by bare copper wires 6½ millimeters (0.22 in.) in diameter. In the shaft the leading wire, of the same diameter, is covered with gutta-percha, which is protected by a covering of lead, the latter being shielded from injury by a sheathing of galvanized iron wire. The return wire is similar to the leading wire, but is without the iron sheathing. Both are suspended at intervals of ten yards on iron hooks. From these shaft cables the current passes into the rails. The insulation of these rails is merely an absence of metallic connection. But it has been found sufficient under all circumstances. No failure has ever occurred from leakage from one line to the other. The locomotive is also a Siemens' machine, mounted on a suitable carriage symmetrically constructed to run in either direction. The conductor has a seat within easy reach of the starting and stopping levers. The current is taken up from the rails by a kind of brush, which is held in firm contact with the rails by a spring. The locomotive is compactly designed; its extreme length is 6 ft. 10 in., its breadth 2 ft. 3 in., and its hight over all 4 ft. 3 in. Its weight is about 31.4 cwt.

The trains are made up of 15 tubs, having each a capacity of 9 cwt. The locomotive is always attached to the rear end of the train to act by propulsion. The speed is such as to occupy four minutes in the run of 630 yards. This speed has been found to give the highest efficiency, and is consistent with safety. During the two shifts of eight hours each, 660 tub loads are run over the plane. This is the present amount of the output; but the quantity might be increased up to 800 tubs without exceeding the power of the locomotive.

Along the roof of the drift are hung upon insulators two bare copper wires of small diameter, communicating with an electric bell in the engine room at surface. By means of these the conductor can communicate with the engineman at surface from any point along the line by merely pressing the wires into contact. In this way he signals "start," "stop," "faster," "slower," as required. The driver at surface can see by the resistance offered to the generating machine when the locomotive is in motion. When the latter is stopped he shuts down his steam and runs light till the locomotive is again set in motion. The plant cost £800 to put in. The manager of the mine states that the working cost for 660 tubs transported in 16 hours amounts to 12s. 2d., or about 0.21d. per tub. It is estimated that horse-power would cost twice that sum.

Academy of Sciences.

On Monday evening last the regular semi-monthly meeting of the Academy of Sciences was held, President Davidson in the chair. Among the donations was a cast of a fragment of the lower jaw of a mammoth, found at the State Prison quarry, Carson, Nev., where so many mammoth footprints have been discovered. Mr. C. D. Gibbes presented the branch of an india-rubber tree which is growing in the open air in this city. Mr. Gibbes read a memorandum making some suggestions as to the adaptability of the climate and soil of California for the growth of the india-rubber tree, for commercial purposes.

The President read a short paper made up of notes from a letter of Lieutenant Doty, describing the volcano of Bogoslov, in the Behring sea. Lieutenant Doty gave a description of the old island, and also of the new one which rose out of the water two years ago. The old island was also elevated during the same disturbance. A strip of sand beach connects the two islands. The party went up the new volcano as far as practicable, but saw no distinct crater, though there is a great fissure through the center of the island, which emits volumes of steam. The rugged nature of the surface and the numerous fissures prevented a thorough investigation. The old island is now inaccessible, the lower portion of its sides being almost vertical.

DIGGER INDIANS predict an open winter.

The Life History of Vaucheria.

[Read before the San Francisco Microscopical Society, August 13th, by A. H. BRECKENFELD, and furnished for publication in the PRESS.]

Nearly a century ago, Vaucher, the celebrated Genevan botanist, described a fresh water filamentous Alga which he named *Ectosperma geminata*, with a correctness that appears truly remarkable when the imperfect means of observation at his command are taken into consideration. His pupil, De Candolle, who afterwards became so eminent a worker in the same field, when preparing his "Flora of France," in 1805, proposed the name of *Vaucheria* for the genus, in commemoration of the meritorious work of its first investigator. On March 12th, 1826, Unger made the first recorded observation of the formation and liberation of the terminal or non-sexual spores of this plant. Hassall, the able English botanist, made it the subject of extended study while preparing his fine work, entitled "A History of the British Fresh Water Algæ," published in 1845. He has given us a very graphic description of the phenomenon first observed by Unger. In 1856 Pringsheim described the true sexual propagation by oospores, with such minuteness and accuracy, that our knowledge of the plant can scarcely be said to have essentially increased since that time.

Vaucheria has two or three rather doubtful marine species assigned to it by Harvey, but the fresh water forms are by far the more numerous, and it is to some of these I would call your attention for a few moments this evening. The plant grows in densely interwoven tufts, these being of a vivid green color, while the plant is in the actively vegetative condition, changing to a duller tint as it advances to maturity. Its habitat (with the exceptions above noted) is in fresh water—usually in ditches or slowly running streams. I have found it at pretty much all seasons of the year, in the stretch of boggy ground in the Presidio, bordering the road to Fort Point. The filaments attain a length of several inches when fully developed, and are of an average diameter of 1-250 (.004) inch. They branch but sparingly, or not at all, and are characterized by consisting of a single long tube or cell, not divided by septa, as in the case of the great majority of the filamentous Algæ. These tubular filaments are composed of a nearly transparent cellulose wall, including an inner layer thickly studded with bright green granules of chlorophyll. This inner layer is ordinarily not noticeable, but it retracts from the outer envelope when subjected to the action of certain re-agents, or when immersed in a fluid differing in density from water, and it then becomes distinctly visible, as may be seen in the engraving (Fig. 1). The plant grows rapidly, and is endowed with much vitality, for it resists changes of temperature to a remarkable degree. *Vaucheria* affords a choice hunting ground to the microscopist, for its tangled masses are the home of numberless infusoria, rotifers, and the minuter crustacea, while the filaments more advanced in age are usually thickly encrusted with diatoms. Here, too, is a favorite haunt of the beautiful zoophytes, *Hydra viridis* and *H. vulgaris*, whose delicate tentacles may be seen gracefully waving in nearly every gathering.

Reproduction in Vaucheria.

After the plant has attained a certain stage in its growth, if it be attentively watched, a marked change will be observed near the ends of the filaments. The chlorophyll appears to assume a darker hue, and the granules become more densely crowded. This appearance increases until the extremity of the tube appears almost swollen. Soon the densely congregated granules at the extreme end will be seen to separate from the endochrome of the filament, a clear space sometimes, but not always, marking the point of division. Here a septum or membrane appears, thus forming a cell whose length is about three or four times its width, and whose walls completely inclose the dark-green mass of crowded grannles (Fig. 1, *b*). These contents are now gradually forming themselves into the spore or "gonidium," as Carpenter calls it, in distinction from the true sexual spores, which he terms "oospores." At the extreme end of the filament (which is obtusely conical in shape) the chlorophyll grains retract from the old cellulose wall, leaving a very evident clear space. In a less noticeable degree, this is also the case in the other parts of the circumference of the cell, and, apparently, the granular contents have secreted a separate envelope, entirely distinct from the parent filament. The grand climax is now rapidly approaching. The contents of the cell near its base are now so densely clustered as to appear nearly black, (Fig. 1, *c*), while the upper half is of a much lighter hue and the separate grannles are there easily distinguished, and, if very closely watched, show an almost imperceptible motion. The old cellulose wall shows signs of great tension, its conical extremity rounding out under the slowly-increasing pressure from within. Suddenly it gives way at the apex. At the same instant, the inclosed gonidium (for it is now seen to be fully formed) acquires a rotary motion, at first slow, but gradually increasing until it has gained considerable velocity. Its upper portion is slowly twisted through the opening in the apex of the parent wall, the granular contents of the lower end flowing into the extruded portion in a manner reminding one of the flow of protoplasm in a living Amœba. The old cell wall seems to offer considerable resistance to the escape of the gonidium, for the latter, which displays remarkable elasticity, is pinched nearly in two while forcing its way through, assuming an hour-glass shape when about half out. The rapid rotation of the spore continues during the process of emerging, and after about a minute it has fully freed itself. (Fig. 1, *a*). It immediately assumes the form of an ellipse or oval, and darts off with great speed, revolving on its major axis as it does so. Its contents are nearly all massed in the posterior half, the comparatively clear portion invariably pointing in advance. When it meets an obstacle it partially flattens itself against it, then turns aside and spins off in a new direction. This erratic motion is continued for usually seven or eight minutes. The longest duration I have yet observed was a little over nine and one half minutes. Hassall records a case where it continued for nineteen minutes. The time, however, varies greatly, as in some cases the motion ceases almost as soon as the spore is liberated, while in open water, unretarded by the cover glass or other obstacles, its movements have been seen to continue for over two hours.

The motile force is imparted to the gonidium by dense rows of waving cilia, with which it is completely surrounded. Owing to their rapid vibration it is almost impossible to distinguish them while the spore is in active motion, but their effect is very plainly seen on adding colored pigment particles to the water. By subjecting the cilia to the action of iodine, their motion is arrested, they are stained brown and become very plainly visible.

After the gonidium comes gradually to a rest its cilia soon disappear, it becomes perfectly globular in shape, the inclosed granules distribute themselves evenly throughout its interior, and after a few hours it germinates by throwing out one, two, or sometimes three tubular prolongations which become precisely like the parent filament (Fig. 2).

Eminent English authorities have advanced the theory that the ciliated gonidium of *Vaucheria* is in reality a densely crowded aggregation of biciliated zoospores, similar to those found in many other Confervoid Algæ. Although this has by no means been proven, yet I cannot help calling the attention of the members of this society to a fact which I think strongly bears out the said theory: While watching a gathering of *Vaucheria* one morning when the plant was in the gonidia-forming condition (which is usually assumed a few hours after daybreak) I observed one filament, near the end of which a septum had formed precisely as in the case of ordinary filaments about to develop a spore. But, instead of the terminal cell being filled with the usual densely crowded cluster of dark green granules constituting the rapidly forming spore, it contained hundreds of actively moving nearly transparent zoospores, *and nothing else*. Not a single chlorophyll granule was to be seen. It is also to be noted, as a significant fact, that the cellulose wall was *intact* at the apex, instead of showing the opening through which in ordinary cases the gonidium escapes. It would seem to be a reasonable inference, I think, based upon the theory above stated, that in this case the newly formed gonidium, unable to escape from its prison by reason of the abnormal strength of the cell wall, became after a while resolved into its component zoospores.

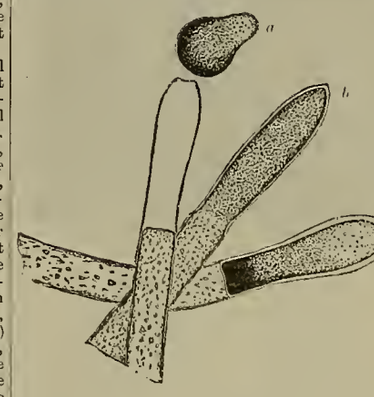

Fig. 1.—Growth of gonidia.

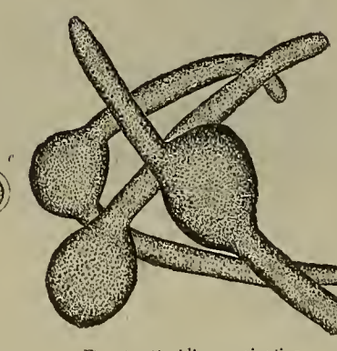

Fig. 2. Gonidia germinating.

Fig. 4.—Antheridium and Oospores. V. racemosa.

Fig. 3.—Antheridium and Oospores. V. sessilis.

GROWTH OF THE ALGA, VAUCHERIA, UNDER THE MICROSCOPE.

Wonders of Reproduction.

I very much regret that my descriptive powers are not equal to conveying a sufficient idea of the intensely absorbing interest possessed by this wonderful process of spore formation. I shall never forget the bright sunny morning when for the first time I witnessed the entire process under the microscope and for over four hours scarcely moved my eyes from the tube. To a thoughtful observer I doubt if there is anything in the whole range of microscopy to exceed this phenomenon in point of startling interest. No wonder that its first observer published his researches under the caption of "The Plant at the Moment of Becoming an Animal."

Formation of Other Spores.

The process of spore formation just described, it will be seen, is entirely non-sexual, being simply a vegetative process, analogous to the budding of higher plants, and the fission of some of the lower plants and animals. *Vaucheria* has, however, a second and far higher mode of reproduction, viz.: by means of fertilized cells, the true oospores, which lying dormant as resting spores during the winter are endowed with new life by the rejuvenating influences of spring. Their formation may be briefly described as follows: When *Vaucheria* has reached the proper stage in its life cycle, slight swellings appear here and there on the sides of the filament. Each of these slowly develops into a shape resembling a strongly curved horn. This becomes the organ termed the *antheridium*, from its analogy in function to the anther of flowering plants. While this is in process of growth, peculiar oval capsules or sporangia (usually 2–5 in number) are formed in close proximity to the antheridium. In some species both these organs are sessile on the main filament, in others they appear on a short pedicel (Figs. 3 and 4). The upper part of the antheridium becomes separated from the parent stem by a septum, and its contents are converted into ciliated motile antherozoids. The adjacent sporangia also become cut off by septa, and the investing membrane, when mature, opens at a beak-like prolongation, thus permitting the inclosed densely congregated green granules to be penetrated by the antherozoids which swarm from the antheridium at the same time. After being thus fertilized the contents of the sporangium acquire a peculiar oily appearance, of a beautiful emerald color, an exceedingly tough but transparent envelope is secreted, and thus is constituted the fully developed oospore, the beginner of a new generation of the plant. After the production of this oospore the parent filament gradually loses its vitality and slowly decays. The spore being thus liberated sinks to the bottom. Its brilliant hue has faded and changed to a reddish brown, but after a rest of about three months (according to Pringsheim, who seems to be the only one who has ever followed the process of oospore formation entirely through), the spore suddenly assumes its original vivid hue and germinates into a young *Vaucheria*.

Charm of Microscopical Study.

This concludes the account of my very imperfect attempt to trace the life history of a lowly plant. Its study has been to me a source of ever increasing pleasure, and has again demonstrated how our favorite instrument reveals phenomena of most absorbing interest in directions where the unaided eye finds but little promise. In walking along the banks of the little stream, where, half concealed by more pretentious plants, our humble *Vaucheria* grows, the average passer-by, if he notices it at all, sees but a tangled tuft of dark-green "scum." Yet, when this is examined under the magic tube, a crystal cylinder, closely set with sparkling emeralds, is revealed. And although so transparent, so apparently simple in structure, that it does not seem possible for even the finest details to escape our search, yet almost as we watch it, mystic changes appear. We see the bright green granules, impelled by an unseen force, separate and re-arrange themselves in new formations. Strange outgrowths from the parent filament appear. The strange power we call "life," doubly mysterious when manifested in an organism so simple as this, so open to our search, seems to challenge us to discover its secret, and, armed with our glittering lenses and our flashing stands of exquisite workmanship, we search intently, but in vain. And yet, *not* in vain, for we are more than recompensed by the wondrous revelations beheld, and the unalloyed pleasures enjoyed, through the study of even the unpretentious *Vaucheria*.

[The illustrations accompanying this paper we have made by photo engraving Mr. Breckenfeld's drawings. The amplification of the objects in the engravings is about 80 diameters.—EDITORS PRESS.]

Nevada County Mines.

From a descriptive article of northern central California, in the *Record-Union*, we take the following paragraph concerning Nevada county:

Mining is at present, and will be perhaps for some time to come, the leading industry of the county. Hydraulic mining having been stopped by a decree of the Federal Court, no effort will be made, for some time at least, to wrest from those vast deposits of gravel the fabulous amount of the treasure hidden among its blue and white pebbles; unless, indeed, which is quite improbable, some new method be discovered by which the precious metal can be extracted from those old subterranean river beds. For the time being, that successful branch of mining, which added so much to the general prosperity of the county and State, is entirely ruined, and mining operations are now confined to extracting and crushing quartz and to the drifting of gravel deposits. The gold miner, trying his luck in this county, must rely upon quartz mining for his pile. Gold-bearing ledges are so numerous in Nevada county that they may be said to intersect it in all directions, and with the improvments in modes of crushing rock and saving gold sulphurets the number of new ledges being opened and worked is increasing daily. Ledges that were regarded in early days as almost worthless are to-day worked successfully.

Nevada county is the largest gold producing section on the coast; and it will, without doubt, continue to be such for many years to come. Iron and copper mines are also worked with success in the most southerly part of the county, and there lime is also found in large quantities. The county abounds likewise in marble, agate, manganese and other minerals used in commerce. Hay, potatoes and all kinds, of vegetables are raised in considerable quantities in all parts of the county, up to an altitude of 4,000 feet.

THE MISSOULA PLACER FIND.—Later accounts locate the gold mines reported to have been discovered four miles east of Missoula last week, on a high gravel bar opposite the old Mashall grade, and some distance from the river. It is said to be quite an extensive bar, and that almost inexhaustable locations have been made by Missoulians. Gold is found from the grass roots down. One man got about four inches of water turned on and washed out several dollars in a short time. The gold is reported by some to be very fine, light colors, but the Missoula *Times* says the dust yields from four to six cents to the pan, which would be "big pay." The *Times* further says that water was taken on the bar by a ditch, but as soon as turned on the loose dirt absorbed it, and the effort was abandoned. Parties are now out with the object of going to bedrock, and, if the prospects justify, will bring in a ditch and put on a hydraulic. A Chinaman is said to have offered claim-owners $1 per day for the privilege of putting Chinaman on. Up to latest advices there was considerable anxiety in Missoula to know what the claim amounted to, but not enough prospecting has been done to satisfy it.—*New Northwest.*

UTAH MINES.—The Salt Lake *Tribune* says: Not every one knows the fact, but Utah just now has three mines which are yielding more with less noise than any other three mines in any other State or Territory of the republic. One of them, too, has the best record of any mine in the world, except the Eureka Consolidated. It has never levied an assessment and has paid some $5,000,000 in dividends.

ENGINEERING NOTES.

Pittsburgh Bridges.

With the completion of the Seventh street bridge, says the *Chronicle-Telegraph*, Pittsburgh will be one of the most notable points in the world for the examination of bridge architecture. The old stone structure, involving the heavy arch and the keystone, one of the earliest forms of space construction known, is not represented here, but all modern ideas in bridge-building are most beautifully exemplified. This city will shortly become a resort for those requiring instruction in bridge forms, and it is a source of honest pride that we already have such a diversity of the very best designs known to modern engineering. The Point bridge has but one other like it in the world, and that is in Austria. It is a combination of steel and iron that 40 years ago would have been recognized as one of the wonders of the world. The new Smithfield street bridge is also a magnificent work of metallic architecture, and the Sixth street wire bridge is, without exception, the "prettiest" structu e of the kind on the continent. In the sweeps of its cables, its minareted towers and the curve of each span, there is something so pleasing to the eye that the bridge fastens itself on the memory of all who cross it. Singular as it may seem, the most notable bridge of the entire number is one that attracts the least attention. As "art work in timber," the Ninth street bridge is a curiosity. It is so braced, tenneted and keyed that it is an exceptional piece of mechanical ingenuity. The railroad bridges, also, crossing both rivers are worthy the careful study of engineers. There are few cities in the world where mechanical effects can be studied with more satisfactory results than in Pittsburgh.

NOTABLE CANALS.—The Imperial canal of China is over 1,000 miles long. In the year 1681 was completed the greatest undertaking of the kind in Europe, the canal of Languedoc, or the Canal du Midi, to connect the Atlantic with the Mediterranean; its length is 148 miles, it has more than 100 locks, and about 50 aqueducts; and in its highest part it is no less than 600 feet above the sea; it is navigable for vessels of upward of 100 tons. The largest ship canal in Europe is the great North Holland canal, completed in 1825. It is 124 feet wide at the water surface, 31 feet wide at the bottom, and has a depth of 20 feet; it extends from Amsterdam to the Helder, 51 miles. The Caledonian canal, in Scotland, has a total length of 60 miles, including 3 lakes. The Suez canal is 80 miles long, of which 66 miles are actual canal. The Erie canal is 350½ miles long; the Ohio canal, Cleveland to Portsmouth, 332; the Miami and Erie, Cincinnati to Toledo, 291; the Wabash and Erie, Evansville to the Ohio line, 374. The Suez canal is 26 feet 4 inches deep, 72 feet 5 inches wide at bottom, 329 feet wide at water surface. Length a little short of 100 miles. The Panama canal is to be 45½ miles in length.

A MONSTER BRIDGE.—A monster work in bridge construction is about to be undertaken in Russia. The structure is to be thrown across the arm of the sea, which flows between Cronstadt, the famous fortress that guards the mouth of the Neva and the approach to St. Petersburg, and Oranienbaum, a seaside suburb of the capital of the Czars. The length of the bridge is to be five miles, and it will be stretched across granite columns or piers, whose sides will be protected by angled abutments of granite of considerable hight, and stretching far enough out to furnish a complete protection from the eroding force of the waves when the southwestern gales are blowing.

EXAMINATION OF COALS PROPOSED.—Chief Engineer Isherwood, United States Navy, who deservedly takes rank among the finest engineers and experimenters in this country, urges that a commission of properly qualified scientists be appointed to make, together with an ultimate analysis of the coals and their volatile parts, an exhaustive set of experiments on the heat of combustion of the different coals we produce, and on those of the more important foreign coals with which our own must commercially compete in the near future. He points out that, rightly interpreted, these heats of combustion give the relative calorific powers of the coals, and, of course, respective commercial values.

A RAILROAD ACROSS THE SAHARA.—C. P. Huntington, the great railway magnate, is quoted as saying "he never would be satisfied until he was instrumental in building a railroad across the great Sahara desert, that it was a work he had long contemplated, and, if his health permitted it, he would yet live to see this, the greatest achievement of his life-time, fully accomplished."

THE HUDSON RIVER TUNNEL ABANDONED.—The once famous Hudson river tunnel, upon which $1,000,000 has been expended, has been abandoned, it would seem, forever. The hole is full of water, and as the janitor of the dilapidated building which covers the entrance said to a reporter: "I've lost the kay."

THE strength of the Brooklyn bridge was shown in the last earthquake. Though the shock was felt at both the entrance of the bridge and at the depots, no jar whatever was noticed on the span and in the center of the bridge.

USEFUL INFORMATION.

Theatrical Effects.

In nothing has the property-man improved so much of late years as in the quality and effectiveness of stage lightning. Only three or four years ago the old method was adhered to. A torch with a flame surrounded by a tin box perforated with fine openings, and the box filled with powdered rosin, did duty for this effect. The prompter gave a shake of this torch; the powdered rosin escaped in small quantity and flared up. This was the nearest the stage could come to counterfeiting the artillery of Jove. Now a calcium (or better, an electric) light is completely masked in the wings. When the cue is given for the lightning, the light is unmasked for a second and the rays allowed to flash on to the stage through a lens of greenish glass. The effect of a blinding flash of lightning is perfect. And yet so simple? Yes; and it is the simplest things on the stage that gain the greatest success. The effect of scudding clouds in a storm at sea is only the dragging across the dark flat a net with gauze patches sewed on it, and touched up by the painter to resemble clouds under the uncertain light of the stage. A fog or mist has always puzzled machinists, and puzzles them yet. The best they can do is to hang successive curtains of tarletan or mosquito netting (gauzes they call these curtains on the stage) across the stage at the different entrances, and raising them successively as the fog is supposed to disappear. There is no illusions at all. It never used except when absolutely necessary as in "Midsummer Night's Dream," and even then is often cut out after the first night's trial.—*Mechanical News.*

TESTING BEESWAX.—When the wax is chewed it should have no disagreeable taste and must not stick to the teeth. In an adulterated wax, the nature of the foreign material can generally be detected by the taste; the addition of fat can generally be readily detected. If it sticks to the teeth the presence of rosin may be assumed. A simple method for detecting the presence of fat in wax consists in melting it, and placing a drop on a piece of woolen cloth. After it is perfectly cold and solidified, a few drops of per cent alcohol are poured on and the cloth rubbed between the hands. The wax will be converted into dust, and will easily separate from the cloth if it contain no fat, and will leave no stain; when it contains fat it will leave grease spots. In examining wax candles, they should be broken to see wether the interior is of the same material as the surface, because adulterations of this kind occur quite frequently.

THE COAL TAR COLOR INDUSTRY is chiefly, and in its highest perfection, carried on in Germany, where, during the year 1883, colors in value $1,750,000 were manufactured. During the same time England produced colors in value ten millions, Switzerland six millions, France and Austria four millions each. This is about double the figure of a year's work ten years ago. Coal is now worth ten times what it was at the beginning of this immense industry. On the other hand fuschsine at the beginning of 1855 was worth £50; in 1867 it had gone down to thirty shillings, and at the beginning of 1878 it was selling freely at fifteen shillings per kilogramme. The quantity of coal tar now annually used for the preparation of aniline, anthracene and naphthaline colors is about 600,000,000 kilogrammes.

FLAVORING MELONS.—The Los Angeles *Herald*, a short time since, mentioned the new process of flavoring melons by inserting a strip of cloth in the stem of the melon and immersing one end of the cloth in strawberry, vanilla, peppermint, sherry or some other popular flavor. The San Bernardino *Index*, a temperance paper, tells how the thing was tried in that town. He took lemon in his: "Mr. George Cooley, who lives on D street, some eight or nine days ago, having a fine large melon that was ripening nicely, determined to try the flavoring idea. Lemon was selected as being the most easily recognized. The melon was recently cut and tested. The flavor was delicate but easily recognized, and the new process unanimously pronounced a decided improvement.

SHEEP'S HORN FOR HORSESHOES.—A new horseshoe has lately been experimented with at Lyons, France. The shoe is made entirely of sheep's horn, and is found particularly adapted to horses employed in towns and known not to have a steady foot on the pavement. The results of the experiments have proved very satisfactory, as horses thus shod have been driven at a rapid pace on the pavement without slipping. Besides this advantage, the new shoe is very durable, and though little more expensive than the ordinary one, seems destined sooner or later to replace the iron shoe, particularly for horses employed in large cities, where, besides the pavement, the streets are intersected by tramway rails, which from their slipperiness constitute a source of permanent danger.

TO POLISH FINE CARVED WORK.—Take a half a pint of linseed oil, half pint of ale, the white of an egg, one ounce of French spirits, one ounce of spirits of ammonia; shake well before using. A little is to be applied to the face of a soft linen pad, and lightly rubbed for a minute or two over the article to be restored, which must afterwards be polished off with an old silk handkerchief. This polish will keep any length of time, if well corked; it is useful for cabinet work, and is also recommended for papier-mache work.

BUFFALO HORN FURNITURE. The manufacture of "buffalo horn" furniture has become an industry in New York. The horns are not those of the bison, as is commonly believed, but are from the cattle killed in the abattoirs. They are sold at the slaughter houses for a little more than what the button manufacturers give, are cleaned, dried, scraped and polished. The cost of making these horned goods is less than that of carved wood, but they bring two or three times more than the latter. The new industry is almost monopolized by Germans from Saxony.

OIL FROM SUNFLOWER SEED.—The production of oil from sunflower seed has become an industry of considerable importance in Russia. It is expressed on the spot, and the product is largely employed in the adultoration of olive oil; the purified oil is considered equal to olive and almond oil for table use. The most important industrial applications of the oil are for woolen dressing, lighting, and candle and soap making, it being regarded, for the last named purpose, as superior to most other oils. The Russian article is of a pale yellow color.

COLD WATER IN DEEP LAKES.—D. J. Whittemore, President of the American Society of Civil Engineers, referred, at a recent meeting of that body, to the fact that cold water is frequently obtained by mariners upon the Great Lakes by sinking a corked jug to some depth, and then, by withdrawing the cork, the jug is filled with water very cold and refreshing. Temperature observations on Lake Superior show comparatively constant temperature at the bottom of about 39°, and in depths from 400 to 100 feet.

OUR SALMON FISHERIES.—Perhaps no better idea can be formed of the magnitude and value of our salmon fisheries than through the following paragraph in regard to what has been in only one of our rivers: An examination of Columbia river salmon statistics shows that from the inception of packing in 1866 to the close of the season in 1884 (19 years) there have been packed 6,310,658 cases, with a value of $34,450,000.

A NEW CLOCK has been invented, and is coming into use in Europe, which is warranted by its manufacturers to run for five years without either winding or regulation. The Belgian Government placed one in a railway station in 1881, sealed with the government seal, and it has kept perfect time ever since.

WAX MATCHES.—There is not a single wax-match factory in the United States, all those used here being imported from France, Italy or England, although they also manufactured in Mexico. In England there is an establishment for the manufacture of "vestas," which employs 350 hands.

GOOD HEALTH.

Microscopic Discoveries in Disease.

The use of the microscope as an instrument of scientific research, notably in tracing disease, is yielding truly wonderful results. Thirty years ago the cholera was a visitation involved in mystery; now the mystery exists only in the imagination of the ignorant. Dr. Koch, has demonstrated the causes of cholera to be a microscopic creature, which he calls the "microhe," entering the body through the alimentary canal. He has also discovered methods for its prevention and destruction, and, though its origin remains to be fully detected, he has ascertained its mode of development and its manner of attack. Thanks to the microscope, Dr. Koch finds that the creature thrives only in water, or under moisture where the sporules of decaying organic matter furnish it nutriment, and that it is destroyed by a high heat or through dryness of the atmosphere. Hence he insists that well water, so liable to collect vegetable matter, as also improperly cooked, or inadequately heated, food must be rigorously abstained from, and that artificial heat should be employed as a preventive against the spread of the deadly contagion.

Previous to these latest and most important discoveries, other scientists had, with more or less success applied the microscope in the examination of various diseases. In particular, Pasteur has within the last few years saved millions of money to France through the discovery of the causes of the diseases blighting the silk worm and the vine, and at present he is employing the instrument to find out the nature of hydrophobia and a remedy therefor.

Relying on the powerful assistance of the microscope, high medical authorities to-day contend that the causes of consumption, cancer, yellow fever, and other terrible scourges, will ere long be brought to light by means of more thorough microscopic studies; and here again we are told that parasitic growths will most probably be found at the bottom of the evil.

Although the capacities of the miscroscope have not been understood until a comparatively recent period—it was not until the seventeenth century that powerful microscopes were actively employed in scientific investigations—there is perhaps no other instrument, save possibly the spectroscope, which has undergone such great improvements. As an optical agency it is now at least as perfect as the telescope, and it is fortunate that this is so, for the universe which the first brings under our ken is perhaps of far more practical profit to us than the depths which the second still vainly attempts to fathom. The laws of organization and the nature of vital action are within the grasp of this little, but wonderful, mechanism. *Leslie's Illustrated Newspaper.*

Don't.

Don't go to bed with cold feet. Don't sleep in the same under-garments that are worn during the day. Don't sleep in a room that is not well ventilated. Don't sit or sleep in a draught. Don't lie on the left side too much. Don't lie on the back, to keep from snoring. Don't try to get along with seven or eight hours' sleep out of twenty-four. Don't jump out of bed immediately on awaking in the morning. Don't forget to rub yourself well all over with a crash towel or hands before dressing. Don't forget to take a drink of pure water before breakfast. Don't take long walks when the stomach is entirely empty. Don't start to do a day's work without eating a good breakfast. Don't eat anything but well-cooked and nutritious foods. Don't eat what you don't want just to save it. Don't eat between meals, nor enough to cause uneasiness at meal time. Don't eat the smallest morsel unless hungry, if well. Don't try to keep up on coffee or alcoholic stimulants, when nature is calling you to sleep. Don't stand over hot-air registers. Don't inhale hot air, or fumes of any acids. Don't fill the gash with soot, sugar, or anything else to arrest the hemorrhage when you cut yourself, but bring the parts together with strips of adhesive plaster. Don't wear thin hose or light-soled shoes in cold or wet weather. Don't strain your eyes by reading on an empty stomach or when ill. Don't ruin your eyes by reading or sewing at dusk, by a dim light, or flickering candle, or when very tired. Don't sing or holler when your throat is sore or you are hoarse. Don't drink ice-water when you are very warm, and never a glassful at a time, but simply sip it slowly. Don't take some other person's medicine because you are similarly afflicted. Don't bathe in less than two hours after eating. Don't eat in less than two hours after bathing. Don't call so frequently on your sick friend as to make your company and conversation a bore. Don't make a practice of relating scandal, or stories, calculated to depress the spirits of the sick. Don't forget to cheer and gently amuse invalids when visiting them. Don't call on your sick friend and advise him to take some other medicine, get another doctor, eat more, eat less, sit up, or talk him to death before you think of leaving.

In walking or other exercise, learn to keep the mouth firmly closed and to breathe entirely through the nose. You can walk as far again, with less fatigue and without getting out of breath, than when you breathe through the mouth. Try it.

The best three medicines in the world are warmth, abstinence and repose.

A SEA ATMOSPHERE FOR THE SICK ROOM.—Science is making rapid strides in the direction of prevention and modification of disease. Among the latest advancements in this direction may be noticed a device for a medical aeration of the sick room, by which various atmospheric conditions can be secured. A sea atmosphere may be produced in the following manner: A solution is used, and diffused as spray, consisting of a solution of peroxide of hydrogen (10 volumes strength) containing 1 per cent of ozonic ether, iodine to saturation, and 2.50 per cent of sea salt. The solution, placed in a steam or hand spray diffuser, can be distributed in the finest spray in the sick-room at the rate of two fluid ounces in a quarter of an hour. It communicates a pleasant sea odor, and is the best purifier of the air of the sick room I have ever used. It is a powerful disinfectant, as well as deodorizer, acting briskly on ozonized test solutions and papers. Mr. Carl R. Schomberg has recently invented a large spray producer, which will diffuse the artificial sea air through a hospital ward.

UNITING OF NERVES.—The report that has just appeared to the effect that M. Tillaux has communicated to the Academy of Sciences the successful suture of nerve in two cases, and that in one case function has been restored in a nerve divided for a period of fifteen years, is, if confirmed, one of the most important facts we have had presented to us in our day. The physiologist, not less than the surgeon, will be led to important work by this event, and fresh fields of inquiry relative to nerve conduction may open new and unexpected advances in the theory as well as the practice of the medical art.

A HEALTHY FRUIT.—A lazy dyspeptic was bewailing his own misfortunes, and speaking with a friend on the latter's hearty appearance. "What do you do to make you so strong and healthy?" inquired the dyspeptic. "Live on fruit alone," answered his friend. "What kind of fruit?" "The fruit of industry; and I am never troubled with indigestion."

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SOUTH SPRING HILL.—Amador *Ledger*, Sept. 10: This mine continues to look finely, with quartz enough for a 30-stamp mill. The company have purchased new hoisting machinery, and are also building a car-track from the mine to the mill, so as to avoid the expense of hauling by teams. Grading for the new hoisting works is being pushed ahead, some 15 or 20 men being at work upon the job. The car-track will be 2100 ft long, and made of railroad iron, which is already ordered. The mill has been idle for want of water, but is expected to start again at the end of this week. Dr. T. H. Mayon has resumed operations upon his quartz claim near Amador City.

Calaveras.

TUNNEL.—*Mountain Echo*, Sept. 9: The Stanislaus River and Mining Co. have commenced work on the tunnel to turn the Stanislaus river at Horseshoe Bend. The header is now in about 60 feet, and is rapidly progressing. Soon the working force will be augmented. John Dart, C. E., of Sonora, has the work in charge. The dimensions of the tunnel, according to the survey, will be 20 feet square and 1400 feet long.

El Dorado.

THE INDEPENDENCE MINE.—*Mountain Democrat*, Sept. 13: When Superintendent John McClellan was in town Tuesday he said that the Independence mine, located near Brownsville, this county, is looking far better than he had hoped for. The ledge is strong, and all the ore taken out will pay well for milling. The 12-stamp mill will be started up as soon as some trifling repairs can be made, when we may reasonably expect a boom in the vicinity of the Independence.

TURNING THE STANISLAUS.—*Mountain Democrat*, Sept 10: The Stanislaus River Mining and Tunnel Co. has inaugurated the work of cutting the big tunnel, through which to turn the waters of the Stanislaus river, at Reynold's Ferry. The work is vigorously prosecuted with day and night shifts. The size of the header, which is now in 100 feet, is 6 by 7 feet. The full size of the tunnel will be 10 by 12 feet. It will be a little over 1100 feet in length, and, when completed, will drain over two miles of river bed.

Inyo.

BEVERIDGE DISTRICT.—*Independent*, Sept. 13: During the past week a good prospect has been struck in the Golden Reef mine, Beveridge district. This is the property lately bought by Mr. Nixon. About 12 inches in width of the ledge where now exposed is quite rich, and the chances are that this will greatly increase in size when opened further. Mr. Nixon brought in the first shipment of gold bullion a few days ago. It is confidently expected that the next shipment will be quite large. In Hunter's canyon, in the same district, some Mexicans have made a rich strike lately, but the full particulars are not yet known. The Keynot mill is running steadily. The present outlook for Beveridge district is better than ever before.

Mono.

THE SITUATION.—Homer *Index*, Sept. 9: Nothing definite has yet been learned as to what will be done about the present muddle of its affairs by the May Lundy mine owners. While many still have confidence that the indebtedness of the company will be paid without process of law, that feeling is not so general as it was a week ago. Rumors that the miners would be paid soon have been numerous during the week, and reports to the contrary quite as plentiful, but none of them could be traced to any authentic source. Several dispatches have been received from headquarters in San Francisco and also from F. A. Pike, but such of them as have been made public have not given any information as to what will be done. There are many people in Lundy who will not believe that Pike will allow the May Lundy to go under the hammer until they see it done. The property is too valuable for its owners to lose rather than pay the few thousand dollars indebtedness upon it.

A NEW LEASE OF LIFE.—Homer *Index*, Sept. 13: It would seem as though the May Lundy mine had actually been sold, the deeds signed and delivered and the money paid over at last. The miners having notified the late owners that they (the miners) would file liens unless paid on or before the 15th instant (Monday next), George W. Butterfield, who was one of the owners and who negotiated the sale of the property, telegraphed back from San Francisco that the time allowed was all that was desired, and that the miners would be paid on the 15th, or sooner. Fox & Kellogg also wrote and telegraphed on Monday last that the mine had been sold, that the money was in the hands of a third party, to be paid over as soon as the instruments of the sale were completed, and that the only remaining document or deed to complete the sale was in the registered mail to arrive by overland train that afternoon —the train having been delayed. It is not yet known here who the purchasers are, but it is believed that they are the same English and Scotch capitalists with whom Mr. Butterfield has been negotiating for the past twenty months. Nothing is yet known of the intentions of the new company, but work in the mine will doubtless soon be resumed, and prosecuted all winter. In any event, Lundy will have quite a boom next week over the disbursement in our midst of some $35,000, and all the indications are favorable for the steady growth and permanent prosperity of the camp. Work is being steadily prosecuted on the Tip Top, White Cloud, Collamer, Josie Green and other mines on the mountain between Mill Creek and Lake canyons. It is reported that the clean-up of the Gorilla M. & M. Co, on Monday last was an unusually heavy one. The mine and reduction works are running full handed. Another Eastern company is in process of organization to mine in Tioga district, to develop the Rinedollar group of mines. Twenty-five to thirty men are still engaged in prospecting work in Tioga and Prescott districts. The Bryant mine is still turning out rich ore, and making steady and heavy shipments of bullion.

Nevada.

NORTH STAR MINE.—Grass Valley *Union*, Sept. 9: A visit to the North Star mine, yesterday, showed a scene of busy labor, as about forty men in all were at work upon the buildings, excavating for foundations for machinery, doing mason and other work. A large part of the frame of the hoisting and and pumping works is up, which will be a building 65x135 feet. William S. May is superintending the building of the structure, and the work goes on rapidly. The bob pit is nearly excavated, and the enlargement of the upper portion of the old shaft into three apartments is well under way. A large space of ground near the new works is covered with machinery and material of various kinds, ready to put in place as needed. A stock of 300 cords of wood is accumulating on the yard, and altogether it begins to look as if old times are coming again at the North Star. Much work has been done within the short time since operations were commenced, and much remains to be done; but, in the way in which everything is being pushed, Superintendent Stoddart says steam will be started up early in October. The shaft is being put in better shape than ever before, and the track will be laid with T rail, which is now on the ground. The drain tunnel, which is 2,600 feet in length, has been cleaned out one-half its distance, and has been found in excellent condition, only a few setts of new timber being found necessary, although the tunnel has been in disuse for a number of years.

NEW MACHINERY.—Nevada *Transcript*, Sept. 9: At the Nevada City mine the management has for some time past been principally engaged in putting in new machinery of great power, and doing a vast amount of dead work underground. Now the taking out of ore in large quantities is going on again. Some of the quartz being hoisted is as rich as any ever found in the mine. At the Hussey mine in Willow valley, a back ledge, much larger and richer than anything heretofore found in the mine, has been developed and the owners are getting it opened up as rapidly as possible.

Placer.

A RICH MINE.—Placer *Herald*, Sept. 13: The Hawkins and Peardon boys, owners of the famous Morning Star quartz mine, below Ophir, have lately resumed work again, and are taking out better rock than the mine ever produced before. We were shown some specimens by them a week ago, taken from the south drift of the 300-ft level, which were literally sprinkled with gold. They have now over 100 tons of ore on the dump which they estimate will go over two ounces to the ton. Their ledge is from 2½ to 3 ft thick and is all milling ore. This mine has a wonderful record as a gold producer, and it seems to improve as it becomes better developed.

Plumas.

THE CRESCENT.—Greenville *Bulletin*, Sept. 10: Mr. Geo. P. Cornell having been appointed superintendent of the Crescent mine, went down there on Thursday and took charge of the property. The company have had some legal complications to contend with, and they have not been disposed to operate the mine till those obstacles are out of the way. Save one, these legal difficulties are now settled, and the community will join in wishing that the remaining one shall be settled satisfactorily to the litigants. Mr. Cornell hopes to have the mine operated soon after the legal difficulty is disposed of. The Crescent mine has been one of the richest in this section, and it is confidently believed by our best mining men that should the company sink on the mine, they would reap a rich reward for the outlay. Mr. Cornell is a close calculator and an economical miner, and will make the best use of the funds placed at his disposal for the development of the mine. That he would soon have it paying well we have no doubt. Work in the Sunset mine is progressing. C. G. Rodgers was in town yesterday. Things at the Green Mountain are running regularly. The New York mill is now running on ore from the Central Ledge, a claim adjoining the New York. The Arcadian mill has ceased to run on Forest King rock, the lease of the mill having expired. The owners of the mine have made a handsome profit, and they will now further develop the mine.

Shasta.

PAYING WELL.—Trinity *Journal*, Sept. 12: While we were at French Gulch, Shasta county, last Saturday, we learned that the quartz mines in that district were all doing well. The Niagara, owned by Wm. T. Coleman, of San Francisco, shipped $16,000 last month, running a 12-ton cannon-ball mill. Thos. Green is running a 6-ton cannon-ball on ore from his mine, the last clean-up being something over $1,000 from 60-hours run, the total product for the month being $3,500. The Brunswick mine has about 200 tons of good ore on the dump and will put in a cannon-ball mill already ordered, as soon as it is received.

San Diego.

PINACATE MINES.—*Press and Horticulturist*, Sept. 13: But while the tin deposits are in litigation and the property unimproved, it is not generally known that, in the same mineral belt and within 20 miles of Riverside, there is a new and daily increasing interest in the gold-producing ledges of the Pinacate district.

For the past three or four years the Mexicans have been "gophering" into these gold-bearing veins for rich pockets that would pay to work in their crude way, and abandoning them as soon as the pocket was exhausted or when they reached the water level. The Good Hope and its extension in the Pinacate district, and the mine worked by Mr. Hoag on the Sobrante are all the properties that have had any money expended on them in the way of systematic development, and, in both cases, the result has been a rich return for their expediture. In both cases the shafts are down 200 feet in well-defined ledges, that, as the excavations proceed, steadily improve in width of vein and richness of ore. Mr. Hoag's mill is running night and day on ore from his mine on the Sobrante, and Mr. Moore's (formerly Lawshe's) is crushing very rich ore from the Barber mine or extension of the Good Hope. To this last mill Mr. Moore has added a concentrator to collect and save the sulphurets which are found in nearly all the ores in that vicinity, and which increase in quantity and richness with the depth of the vein. Mr. Moore, who is reported to represent a Wisconsin company, has also bought the Santa Fe, and other locations that have been sufficiently prospected by the Mexican method to class them as paying claims, and has several men at work on one or two of them. A St. Louis Co., has also invested in several of these Mexican claims, and intends to put up dwelling houses and a 10-stamp mill this fall, at what is known as the "Virginia" claim or "Camp Castillo," about fifteen miles due south of Riverside. A mile farther south, just over the range, at the head of a valley or park, known as Cedar Flat, Mr. H. C. Steele, of Missouri, has purchased another of these claims—the Plomo—which formerly supplied three arastras with ore. He is taking out $100 ore in the Plomo; has several other locations which prospect well, and will put up a mill as soon as he has sufficient ore in sight to warrant the investment. The best developed Mexican mine in this district is the Colorado, owned jointly by Louis Martini, a Mexican, camped near the mine, and a gentleman from Riverside, This mine has supplied from three to five arastras with ore for the past year, and several Americans are anxious to possess it, but there is a dispute about the title and it will not change hands until that is settled; and when it is settled the lawyers will undoubtedly own it. In addition to the above a San Diego company has located five claims in and near Cedar Flats and are now at work on two or three of them, one shaft having been sunk to water (80 feet), and one or two others to a less depth. Probably twenty additional claims have been located by Americans in the Pinacate district within the last two months, nearly every one of which carries gold from the surface. Some of the larger ledges give indications of silver, and one iron-capped ledge has been discovered that assays seven per cent tin. Nearly all the locations referred to as gold bearing lie between the first two mentioned, which are the best paying because they are the best developed mines in the group, and they are all of the same general character and all improve with increasing depth. That gold exists in paying quantities on the Sobrante and in the adjoining Pinacate district is proven by the work already done. Capital is now being invested in that vicinity, and there are scores of claims that only await a small outlay in the way of improvements to become first self-sustaining and then to yield as rich returns as the Hoag, Moore, and Barber mines.

Sierra.

PROSPECTING.—Sierra *Tribune*, Sept. 10: George Davis and Lem Davis this week went up to do some work on their ledge in Lady's canyon. They will sink a shaft and otherwise prepare to prospect the claim. The vein is about 6 ft wide and promises well. It is located north of the Columbo mine.

Trinity.

RICH QUARTZ.—Trinity *Journal*, Sept. 12: Mr. J. L. Day was in town this week from East Fork and displayed some very rich specimens from the mine of Day, Moor & Co. He tells us that they are now down 25 ft on the ledge and that it has improved both in richness and extent. Jake Holsinger and his partner have lately discovered two ledges running parallel, about 15 ft apart, one being two and the other 6 ft in width. Both prospect well, the smaller one showing very rich in free gold. Messrs. B. M. Lough and Murray, both quartz experts and miners of large experience, are now at East Fork and are well pleased with that section. They have been all over Nevada, and only lately came from Bodie, and say they never saw so much gold in quartz as in that shown them at East Fork. The district is rich and extensive and should receive more attention from prospectors than it has this summer.

DEADWOOD.—Cor. Trinity *Journal*, Sept. 12: I paid a visit to the Montezuma which is the personal property of Mr. Klein. In places the ledge varies from 8 to 20 ft in width most of which is good paying ore. A cannon-ball mill of 6 ton capacity is being erected and bullion will be the closing result of the next season. Mr. Stewart Gibson and Frank Belleau have struck an "eight footer." From "Stewart" I learn the rock is highly auriferous and improves both in richness and size as they continue. Otis Collopy has discovered a very rich lode on Thorn gulch the rock showing free gold and estimated to go $100 to the ton. William Lapin is taking out ore in different places all over his location, there being four or five veins upon the hill above the main lode. McDonald & Franck's new mill is a beauty and sends encouragement to the prospector's ear when she toots up her morning song. From what I learn Mr. Watt and others have purchased the property of Lambeth & Grayson and will continue operations on the mine. Four mills will soon be in operation and the next season when the "rain begins to fall" Deadwood with her arastras and mills will be in the hight of her glory.

NEVADA.

Washoe District.

HALE AND NORCROSS.—Virginia *Enterprise* Sept. 13: Work has been temporarily suspended in the main north drift on the 2800 level. It is ont 275 feet, and work in the drift was suspended for the reason that sinking has been resumed in the winze, and until a certain depth had been attained in the latter the coming in of cars from the drift interfered with the business of sinking. The draft is now out far enough to allow of two cross-cuts being started. These will soon be commenced. The usual amount of ore is being extracted from the 200 level and shipped to the Eureka mill. Since last report they have received bullion to the value of $8,-339.08 from the Eureka mill. Work in the north drift will be resumed this evening.

MEXICAN.—The joint Ophir, Sierra Nevada and Union Con. winze below the 3200 level has been sunk and timbered about eight feet. The usual vein porphyry is taking the place of the bastard quartz which has heretofore been the predominant material at the bottom of the winze. This porphyry, however, is largely composed of quartz and presents a lively appearance. The winze is below the 3300 level and in about another week will have attained a depth sufficient to have a sump 10 feet in depth below that level. A station will then be opened and a cross-cut started west on the 3300 level.

BEST AND BELCHER.—The main west drift on the 2500 level is out about 650 feet. It is in a soft vein material, much mixed with stringers of quartz. This drift will be pushed through to the west wall. The north drift from the 825 station of the Bonner shaft is out about 356 feet. It is in a very favorable material, which appears to indicate the presence at hand of a deposit of metal-bearing quartz.

OPHIR.—On the 250 level some ore is still being extracted from the fillings of the old drifts. On the 500 level they are pushing forward the main west drift at the rate of about 70 feet a week. This drift will soon drain the vein at the old works.

CHOLLAR.—Cross-cut No. 2. on the 2800 level, was run out to the west wall, passing through about 20 feet of quartz of good appearance but carrying only a small amount of metal. Work on the level has been suspended, and they have now resumed sinking in the Chollar-Norcross-Savage shaft, which will be put down to the 3,000 level as speedily as possible. Thus far the work of sinking is progressing rapidly. The pumping apparatus at the shaft is all working well and smoothly.

SIERRA NEVADA.—Are still repairing the draft on the 2300 level through which passes the compressed air pipe.

ALPHA.—The north drift on the 600 level is out nearly 700 feet and the east cross-cut 100 feet. The west cross-cut in Alpha ground, 125 feet north of the Imperil line, is in quartz of a very promising appearance.

ALTA.—Good headway is making in the main east drift on the 2150 level. The water is fast draining out through the diamond drill holes that were run from the face of the drift. The last of these drill holes penetrated the vein a distance of 44 feet, and the drillings gave assays as high as $54. The chances for finding a paying deposit of ore to the eastward are good.

CON. VIRGINIA AND CALIFORNIA.—A drift has been started north on the 1750 level, which will explore a large section of new ground lying to the northward of that portion of the old bonanza ground which was inclosed by means of bulkheads at the time of the fire in the old timbers, some years ago.

YELLOW JACKET.—A considerable amount of ore of low grade is still being found, and some prospecting is being done to open out further supplies. The water supply in the Carson river is falling off somewhat, and the mills cannot be run to their full capacity.

BELCHER.—About the usual amount of low grade ore is being extracted. The volume of water in the Carson river has considerably decreased, and not so much ore can be reduced at the river mills as formerly.

BENTON.—The drift on the 2150 level is passing through quartz of a very favorable appearance, which carries a considerable amount of metal, but not a sufficient quantity to pay for working.

CROWN POINT.—A sufficient amount of ore is still being found to keep the mills on the Carson at work, though, owing to a decrease in the volume of water, they cannot be run to their full capacity.

Aurum District.

PROSPECTS.—White Pine *News*, September 8: From James McNulty, of Aurum, who has been spending several days in town, we learn that the prospects of that district are growing brighter every day. This season Dr. Brooks has done a great deal of prospecting, with most encouraging results. The Sadie L. is looking especially well. A drift run from the tunnel has cut a ledge five feet wide of good milling ore. The mill will be started up this fall, and a prosperous run is sure to be made. Dr. Brooks is to be commended for the faith and energy he has displayed in unearthing the mineral wealth of Silver Canyon District. May he reap a rich reward.

Bristol District.

ORE.—Pioche *Record*, Sept. 6: There is a large pile of ore from the Day and Mendha mines piled on the furnace dump at Bristol, and the teams keep hauling right along. Foreman Walsh, while we were out there on Monday, informed us that the furnace would be in repair and running in about ten days or less. The coal-burners are now all out burning coal, and the coal which was burned for the Bullionville Company, before it was closed down, is now being hauled out to Bristol. This coal has to be hauled about 40 miles.

Comet District.

BIG LEDGE.—Pioche *Record*, Sept. 6: Clark & Willett have the best prospect in Comet district. They have paid their way ever since they have worked the mine. The ledge is narrow and very rich. Freudenthal & Co. have a good prospect. The ledge is a big one and the croppings assay well. The croppings indicate a big mine somewhere in the vicinity.

Garfield District.

WORK PROGRESSING.—Grantsville *Bonanza*, Sept. 6: From James Graham, who has just returned from Garfield District, Esmeralda county, we learn that work is progressing steadily in the mines with the most encouraging results, and that there is enough ore out now to run the mill for a year to come. The mill is fast nearing completion, and will soon be rendering a good account of itself by the magnitude of its bullion shipments. The ores in this district are high grade.

Osceola District.

GOOD RETURNS.—Pioche *Record*, Sept. 6: The rock from Boone Tilford and Capt. Akie's gold mines worked in the Osceola mill came up to expectations. Tilford's rock went $81 to the ton, and Akie's $33. The former cleaned up over $2,000 and the latter $1,200. This showing, says the Taylor *Reflex*, will go far toward giving a different coloring to the black-eye Osceola got by the failure of the Monroe & Linton to pan out well. We are told, by those who are in a position to know, that the Monroe & Linton, purchased by the Osceola Mining Co., is by far the poorest prospect in the camp.

Pennsylvania District.

PAYING WELL.—Pioche *Record*, Sept. 6: The mines down in Pennsylvania district, on some of which there has been work going the past two months, are looking well. The ore ledges look fine, and the only thing needed to make a lively little camp there is to get a company in; but whenever a company forms to take hold of one of the mines, some one of the mine owners always elevates their price from what they first agreed to take for the property, and thus it has been going on for years,

Sherman District.

THE BURKE MINE. Reno *Journal*, Sept. 10: Farmer Burke and Doctor Brooks came in from Sherman District yesterday, and will leave this morning for their home in White Pine. They have made all arrangements for systematic work on the Sherman mine, having purchased hoisting works, buildings, etc., in Virginia. They leave all details with Jim Burke, who will at once have the works taken down and removed to the mine." As this mine is situated a few miles to the northward of this city, on what is supposed to be a continuation of the Comstock silver belt, our people naturally watch the progress of development with some interest. Should a good mine be found, the ore in which showing the Comstock characteristics, it would give points for the sinking of prospecting shafts in intermediate places.

ARIZONA.

MOHAVE. *Miner*, Sept. 13: John O'Brien and Isaac Conkey have just finished the assessment work on the Railton mine below Stockton hill. This claim has a two-foot vein of lead ore averaging from 25 to 30 per cent in lead, 75 ounces in silver and is owned by Messrs. Davis and Atchison. J. F. Luthy has a car-load of ore ready to ship from the Leadville claim near Cerbat. J. C. Asbury is working on the Queen Bee on the summit of the Chloride trail and has struck some $1,000 ore. Messrs. Williams and Roberts have about 200 sacks of ore on the Todd mine ready for shipment which will go in the neighborhood of $200 per ton. Messrs. Wright and Layne have struck an 8-inch streak of 70 per cent galena on the Prosperity mine in Todd basin. They have two men at work on the claim.

COLORADO.

RED ELEPHANT MINES.—Colorado *Miner*, Sept. 8. Louis Baehr, lessee on the White lode, shipped a car-load of ore to the Miner's Sampling Works, Thursday. Syster & Co. have struck a new streak in their workings. It varies from 4 to 20 inches solid, and will mill-run from 250 to 300 ounces per ton. They will ship again next week. Olson & Co., on the Boulder Nest mine, had the following mill-runs this month: One lot run in one class gave 178 ounces silver; another lot run in two classes returned 112 ounces first class and 39 ounces second class. Messrs. O'Brien & Co., lessees on the White lode, had a mill-run which gave returns as follows: 3,110 pounds, 178 ounces silver; 8,672 pounds, 79 ounces silver. Henry Thompson, lessee on the Boulder Nest mine, had two runs this month which gave returns as follows: 414 pounds, 70 ounces silver per ton; 2,099 pounds, 170 ounces silver per ton. I. W. Irwin & Co. had a mill-run from the Boulder Nest which gave the following returns: 4,851 pounds, 128 ounces silver per ton; 6,099 pounds, 112 ounces silver per ton. John Leahy milled some of the ore from the White dump which gave returns of 119 ounces silver per ton. Potter & Co.'s last mill-run from the White mine gave the following returns: 3,727 pounds, 109⅛ ounces silver per ton; 12,985 pounds, 49½ ounces silver per ton.

EMPIRE MINES.—Messrs. Sigel & Co. have made application for a patent on their lode and mill site below the Big Chief. They will soon construct a tram from the mine across to the wagon-road. Col. John M. Dumont is working a large force of men at his mines in North Empire. He is also repairing the old Pioneer mill.

GOOD REPORTS.—Good reports come from the different mines in Daily and Atlantic districts. The Mountain Ram mine, in Daily, has produced some of the richest ore ever found in the State, running over $20,000 per ton. Mr. Charles Robinson has charge of and owns an interest in this property. The Homestake mine, owned by Mr. Armstrong Shepherd, improves as depth is gained. This lode is located in Atlantic district and is in a neighborhood where a number of good lodes have been discovered. The Wise-Speck Mining Company have commenced active work on their Dexter lode on Red Elephant mountain, having let a contract this week to sink the main shaft. This lode is situated near the famous Boulder Nest, White, and other paying lodes, and will no doubt develop into a good mine. This company also own property in Atlantic district that looks well, especially their Ella lode. At Empire they have the Pilot Knob, a gold lode on Silver mountain. The Mendota lode in the Victoria tunnel has been leased to Sheehan & Co., they taking 600 ft on the west side. They will immediately commence development work and rapidly push a drift to the limit of their lease. This will give them four double stopes of 150 ft each and sufficient to give employment to 32 men. Messrs. Hood & Co. take a lease on the east side of the tunnel and will open ground to the east end line of the Mendota. Messrs. Markey & Co. are working a group of lodes on Lincoln mountain, near Empire. There are several lessees working in different places on the group. A mill-run from the Lucky lode, one of this group, gave 284 ounces silver first class, and 96 ounces second class. An assay recently obtained gave 1,794 ounces. Some of this ore carries horn silver, which is not characteristic to this section of the country. Mr. Hulliberger has discovered a splendid gold lode near the head of Fall river. The crevice shows it to be a fissure vein and the material is unusually rich. Some of the pay streak recently tested gave returns of over 50 ounces in gold. The whole crevice material runs over 7 ounces gold. Good reports are received this week from Bullion camp in Ute creek. The Mollie Downs lode, now being worked, is producing very large returns of good ore. A specimen from this lode brought in this week by Mr. T. S. Wilson shows well in black sulphurets. This ore mill-runs 160 ounces per ton. Assays have been had as high as 800 ounces.

IDAHO.

BONANZA AND CUSTER.—Idaho *Messenger*, Sept. 9: At these places we looked over the mines a little and found them as follows: The Juliet has now a tunnel run in on the lower workings 400 ft in length which strikes the ledge. They are down by shaft and raise 191 ft. There is a drift to the right of the tunnel, or to the east on the ledge 55 ft and to the west 35 ft, and has been some stoping from the left drift. This mine has now a comfortable building for its help built by the superintendent since he commenced the above developments. Wm. Toole has had charge of nearly all the work ever done.

THE CHARLES DICKENS still shows the same superiority over other mines throughout the world, but on account of the death of the discoverer and owner, Wm. A. Norton, is lying idle. There is about 75 tons of very superior ore on the dump, and very large amounts of second-grade ore, besides there is a body of tailings at the arastra that is said to contain a large amount of wealth. This mine, with other valuable mining property, is now being probated and the cessation of work thereon makes the country quite dull. Nothing to discourage permanently, but quiet, very, at present. The General Custer mill is running on Unknown and Summit rock, crushing an average of about 33 tons per day. The latter runs higher in gold than is common for the adjoining claims but far less in silver than the Unknown and Custer have generally done. The pay chutes of the Summit and Unknown seem to have been well worked out, and the mill will be supplied in a short time from Custer rock again.

THE CUSTER.—There is still considerable of the original Custer ore "in sight," and more hope of the main vein of this part of the lead going down than the Unknown and Summit. Still, where a lead is as rich as this whole vein has proven, there is no telling what may be found by further working. Millions of net profit in so short a time as these mines have been run, with the small amount of machinery used, challenges a favorable comparison in vain. Thirty-seven hands in all were working on the mountain at the time of our visit.

NEW DISCOVERIES.—Idaho *Messenger*, Sept. 9: In the Great Basin, on the north side of the Sawtooth range of mountains, at the head of Valley and Cape Horn creeks, a number of promising prospects have been discovered of late, of which our correspondent writes: "Buckskin" and group of mines in that vicinity are 8 miles up Valley creek from Stanley basin. Ten or twelve locations are made. The ore is clean and free chlorides and sulphurets. The ledges, so far, are from one to two hundred ft in width. The ore, as shown by assays, runs all the way from 20 to 265 ounces silver and $3 to $10 gold. The Buckskin, the original location, was discovered a year ago, and is owned by Joseph Dorsey, J. P. Keenan and the W. A. Norton estate. Other claims in the vicinity are located by Tom Cassaday, John J. Gaunt, J. H. Lee, F. J. Clyde, C. C. Clawson, E. G. Dodge, Wm. Galatian and others. The mines are easy of access, and promise well, so far as surface showings are concerned. The Wonder mine, on the south side of Jordan creek, and about one mile from Montana hill, is developing finely under the work of Jack Dougherty. The tunnel is in about 130 ft, and over 100 ft from the surface. The ledge is one to two ft in width—struck in a cross-cut and the ore is full of ruby silver, assaying from 130 to 7,000 ounces silver per ton. This promises to be one of the best mining properties in the district, and is owned by Wm. and Joe Galatian. The Whale mine, owned by the Galatian brothers and Jas. Hooper, is leased for nine months.

A PROMISING FIND.—Wood River *Times*, Sept. 10: Thomas B. Garden came down from his prospect, six miles below Galena, yesterday, and exhibited some specimens of rock from a 14-inch vein of ore he had just struck. The rock is a peculiar formation of quartz and galena, and if present indications hold out, the mine will become one of the best-paying properties on the river. An assay from a choice specimen gave returns of 155 ounces of silver and 67 per cent lead. Mr. Garden and his partners are old prospectors in this district, and, thinking they have struck the long-sought bonanza, are of course jubilant. They hold the value of their prospect at $40,000.

MT. KING.—Idaho *World*, Sept 9: I. N. Daley, one of the owners of the Mountain King mine, on Sheep mountain, arrived here on Saturday and gave us a few items: Fifteen tons of Mountain King ore, recently packed to the Bayhorse smelter, turned out 100 ounces per ton silver, and 53 per cent lead. They have out 7 or 8 tons more of good ore. The Mountain King mine shows up 50 per cent better than it did last year. The ore that was smelted this season was not assorted, and ran over $100 per ton. Work will probably be carried on in this mine all next winter. The owners of the mine are making preparations for the winter. It is the intention to run a tunnel to tap the vein at the depth of 100 or 150 ft. Ore, unassorted, from the Graybound mine, crushed in the Custer mill, turned out 150 ounces per ton. The ore carries both gold and silver. The bullion is worth between $2.50 and $3 per ounce. A shaft was sunk on this mine this season to the depth of 50 ft. The ore improves in richness as they go down. The owners of this mine intend to make another shipment of ore to the Custer mill this fall.

THE PARKER GROUP.—Wood River *Times*, Sept. 10: The Parker group, on Trail creek, continues to yield the usual quantity of ore, the production being limited to 70 or 80 tons per month as the managers wish to keep the development work ahead. But the ore extracted, nevertheless, suffices to pay all working expenses and a profit of $7,000 to $10,000 per month besides. The grade of the ore, too, is enhancing with depth, and the last lot received here a day or two ago, was the best yet. It consisted of 13½ tons, which carried 29 ounces of silver. Its gross yield was $378 per ton—thus leaving fully $300 net, per ton.

ANOTHER ORE-PRODUCER.—The first shipment for the year of ore from the Baltimore and Victoria group of mines has just been received here. It was a lot of 11½ tons, which carried 66⅔ per cent lead and 132 ounces of silver per ton. It netted $1,454.31. The showing of ore in that group is said to be equal to any other on Wood river.

NORTHEASTERN ALTURAS.—Wood River *Times*, Sept. 10: In addition to Blackburn mining district, in Eastern Alturas there are two other camps in that region that are of considerable importance. Badger Creek is one. It is located about 12 miles north of Blackburn district, but in the same formation and on the same belt and vein as the Blackburn district. The most prominent claim there is the Triumph. This is one of the mammoth mines of Idaho. The galena vein is of enormous width, and the ore is so nearly pure lead that it can hardly be broken with a sledge. It flattens out under the hammer. But it goes quite low in silver, as it does not carry over 20 to 40 ounces. From Badger Creek north to Spring Mountains, is only six miles, but here again is another promising camp—Pease & Taylor's. About eight miles further north is Texas camp. All these are on the same huge vein seen in Blackburn district. On the east side of Birch creek, about six miles east of Badger Creek, is the famous Viola mine, which has for many months been yielding 2,000 tons of rich shipping ore. It promises to continue yielding for years.

MONTANA.

AMONG THE MINES.—Butte *Miner*, Sept. 10: Yesterday the *Miner* reporter took a stroll over the Parrott hill, upon which the big copper mines are located. Some parties call the Parrott lode the "Mother lode" of the camp. If one stands at the Mountain View mine and runs his eye along the line of hoisting works from the Montana Colusa to the Original Butte, he will see that all the mines in that line appear to be on one lode. In this line are to be found the most valuable mines, so far worked in this district. The Parrott is one of the big properties of the district. The shaft is 350 ft deep. Ore is being taken out of all the levels at the rate of about 3,500 tons per month. No new work is being undertaken just now. The Montana Parrott, adjoining the Parrott on the east, belongs to the Montana Copper Co. It is a claim 200 ft in length. On this claim there are two shafts. The original shaft is 130 ft deep and follows the lead. From this shaft about 1,200 tons of ore were taken last month. The other shaft is a perpendicular, three compartment shaft, and is now 218 ft deep. This is to be the working shaft. Large hoisting works are in process of erection now.

RAMSDELL PARROTT.—This mine belongs to Mr. Joseph Ramsdell. It was taken up under the old law, and consequently is only a 200 ft claim. There is on it a shaft 260 ft deep. The ore is being taken out of the levels from the 160 to the 240-ft levels. The mine has up to this time been worked with a whim, but a steam hoist is to be put up this month. About 30 tons a day are being taken out. This mine is sending about 50 tons a day to the Bell smelter, 20 tons of this coming off the dump. About two-thirds of this passes through the concentrator before being put in the smelter. The balance goes directly to the smelter. Just east of Ramsdell Parrott is another claim of 200 ft belonging to the Montana Parrott Co. No work is being done on this claim at present. From the Ramsdell Parrott through the claims to the Parrott a level has been run for ventilation. A brief mention was made the other day to the effect that the Anaconda and St. Lawrence had been letting up on their work for the purpose of making some repairs. These repairs are progressing finely, are almost completed, and this week will be again running on full time with a full quota of men. The new office of the company is nearly ready for occupancy.

MOUNTAIN VIEW.—This is one of the finest and most valuable properties in the district. There is on the lead a shaft 635 ft deep. Sinking has now ceased and cross-cutting at 608 ft is going on. At about 30 ft north of the shaft at this level a small vein of fair-looking ore, 2½ ft wide, was struck. A level is being run on this vein. The workmen are in about 30 ft. The quality seems to be improving as they proceed. Mr. C. X. Larabie, the owner of this property, is putting up a new hoist. Several hundred ft east of the shaft-house of the Mountain View and down the hill is the claim called the West Colusa. It is owned by the Montana Copper Co. On this is a shaft 160 ft deep. Water was encountered at about 100 ft down and there was plenty of it, so much indeed that a steam pump was necessary. The mine is worked with a whim. Adjoining this claim on the east is Clark's Colusa. This has become one of the celebrated mines of the camp. The shaft is now 300 ft deep. At that depth the shaft is in the vein. A station has been put in and a level is being run east and west. This mine is shipping about ten tons a day of first-class ore, and Mr. Clark is smelting at the Colorado smelter about 25 tons a day. The Colusa, the property of the Montana Copper Co., is also one of the best-known mines in the district. Recently the company has been sinking from the 400-ft level to 500 ft. The station at that depth has not been completed and the work of sinking another hundred ft is to be begun right away. In the mean time a great deal of ore is being taken out of all the levels. This review of mines only embraces the copper mines on the Parrot hill east of town and in an almost straight line from the original Butte to the Colusa. Any mine whose shaft-house is more than 300 ft away from that line is not included in this enumeration.

THE MOUNTAIN CHIEF SOLD.—The Mountain Chief mine, at Neihart, bonded some time ago to the Boston Hudson Mining Co. for $18,000, was sold to that company last week. They have on the dump 500 tons of ore, valued at $50,000. The company proposes to put up a mill at once. The business manager has gone East to ship the necessary machinery.

THE NEW DIGGINGS.—A committee of two miners, T. P. Asyling and Denis Halpin, was recently sent from Benton to the newly discovered gold mines in the Little Rockies, 135 miles north of Benton, to examine and report on the same. In due time they sent word that the mines were all they had been represented to be, and since then, about the 10th inst., everybody who could go made a stampede from Benton to the new El Dorado. The *River Press* of the 10th had an interview with Frank Aldrich one of the original discoverers, and he said: "We struck it on the 15th of June. Charley Brown and myself were prospecting the Little Rockies, and came upon Louis Meyers, or Dutch Louie, in this gulch. He had found good indication, but had not prospected the gulch well. We propose to cross-cut the gulch, working together, and did so. We found two channels, where big prospects were got. On bedrock where we worked, we got as high as $3.50 to the pan, and it averaged at least 25 cents. There is 5 ft of solid gravel in the channels that averaged a bit to the pan. After doing a good dead of work, and satisfying ourselves that we had big paying diggings, our grub pile got low, and myself and Brown went to Assinaboine for a new supply. We were gone just two weeks and two days, and during that time Louie rocked out 8 ounces of gold, a result that rather tended to elate us. I took this money and went to Maiden to secure additional supplies and some lumber. I endeavored to keep the matter a secret, but by my disposing of the dust it got out, and soon after some 50 men from Maiden and vicinity took the trail and followed us. This was the beginning of the stampede. Seeing it was out, we then proceeded to protect ourselves. A district was organized and laws adopted. Discovery claim was set apart for myself, Brown and Myers and then each of us located claims. A claim is 300 ft from rim to rim. We then commenced work in earnest, my company opening No. 11 above discovery. It paid on an average over $10 a day to the man until I left, and will continue to do so. Bob Main and Charley Smith were preparing to sluice on No. 24 above discovery when I left. They took out $20 one day with a rocker. Our company had $350 in gold, and I brought about an ounce and a half of it with me, as a sample of Little Rocky dust. I am certain, from pretty thorough prospecting, that every claim in that gulch—about four miles in extent—will pay, and I believe the best claims have not yet been touched. I prospected bars that averaged three-quarters of a cent to the pan, but water is too scarce just now to render them valuable. In due time there will be plenty. Now there are about 50 inches in the creek, but in the early part of the season it runs 500 inches. It is almost certain that big pay diggings will be found on People's Beaver and other creeks. Just before I left I learned that two bits to the pan had just been got out of Rocky creek, and it is probable that by this time another district has been organized there, which may be better than ours—which is to be known to the world as the Little Alder mining district of Choteau county, M. T. Some old-time miners in camp think it will be a rival of the famous Alder gulch." In further conversation, Frank said they found near the mouth of the gulch a pit, 100 by 150 ft, that had evidently been sluiced out years ago, and he is of the opinion, concurred in by many others in the gulch, that it was here Chris. Keyes struck it in 1864, to which place he was on his way when killed the following year.

NEW MEXICO.

STRIKE.—Silver City *Enterprise*, Sept. 5: We are informed by a gentleman just in from Fleming that an important strike has been made upon the Rob Roy claim of the Bonanza group. A force of men was put to work upon the mill on Monday by Mr. Hadley, and he has been rewarded by the uncovering of ore that is said to be very rich.

J. W. Fleming and Matt France departed for the Swisshelm mountains on Wednesday to examine the property of Messrs. Fleming, Clark and Sherwood. If the property proves to be what it is represented by the owners, Mr. France will take the mine and make it a producer in as short a time as possible. Mr. France is a man who will benefit any camp he becomes interested in. He represents the stuff that will bring out any camp, and is an excellent judge of mining property.

A. K. Rutter came in from Gold gulch on Wednesday with some of the ore from the Young Man mine that has been opened up within the past two weeks. The ore is of a different character from that on which the large open cut is being driven, being a decomposed black quartz running upwards of $400 in silver. Two feet of vein matter has been stripped for 60 feet, and several shafts have been sunk to determine the extent of the ledge, but all the openings show that it does not vary much from the above width.

UTAH.

REVIEW—Salt Lake, *Tribune*, Sept. 12: The receipts of ore and bullion in this city for the week ending September 10th, inclusive, were, $128,623.36 of bullion, and $3,200 of ore; total, $130,823.30. For the week previous the receipts were: $118,853.48; of ore, $7,850; a total of $126,708.48. The receipts from the Horn Silver for the period last named were twenty-one cars of bullion, $62,000. This brings the total product of the Horn Silver to date for this year up to $1,731,000. The Ontario shipments during the week were fifty-six bars of bullion, valued at $37,832.89. Total product for this year to date, $1,105,900.53. The product of the Hanauer smelter, during the week, was three cars of bullion, $16,700. John A. Daly struck the (Ontario) vein in the Daly ground, with the vein running from the 600-foot station of the shaft, at the time he struck the last new water. The ore is similar to that found in the vein further east, and assays from one hundred to twelve hundred ounces. The galena goes 165 ounces, like that of the Ontario and the Parley's Park; zinc blende about 40 ounces; fahlore—a combination of antimony, arsenic, copper, sulphur and silver—four or five thousand ounces. Prof. Morton at Bingham is having difficulty in applying the leaching process to the Northern Chief ores on account of lime in them, which by roasting becomes burnt lime and destroys the virtues of the solution. If the ores could be treated without roasting, the lime in them would not be deleterious. It is hoped that some remedy may be found for this trouble, which, it is understood, is all that stands in the way of the success of the Northern Chief mill. Russell's leaching process is in use on the tailings of the old Leeds mill.

WASHINGTON TERRITORY.

CLE-EL-UM.—Cor. Kittitas *Localizer*, Sept. 3: Cle-el-um district is situated about 50 miles north and west from Ellensburgh, Kittitas county, W. T., near the headwaters of the Teanaway, Fortune, Arsycle and Engle's creeks, and northeast of Cle-el-um river. The country rock is composed of serpentine, shale, porphyry and granite schist. Its general course is north and west, the mineral belt being a break or spur from the main Cascade mountains, and lying on the eastern slope of the main range, and south of Mt. Baker, covering an area over 60 miles in length, and well supplied with both wood and water for prospecting and mining purposes. The principal mines crop out on the south and west side of the mountains in which they are situated. The outlet to the mines is as good as any one could wish for. The Bullion Company's copper mine is at a depth of 65 ft, and has improved wonderfully. The owners are well pleased, and are sinking their incline as fast as possible. They have had ore continuous for the last 40 ft. They have about ten tons of ore on the dump that is worth on an average over $200 per ton. The Tacoma Co. has not been so successful; they have had the misfortune to employ men, claiming to be miners, who did not know a piece of bed-rock from quartz. The mines are now all looking well, and I think at no distant day we shall be able to show to the outside world that there are good paying quartz mines—gold, silver and copper—in Washington Territory.

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HOISTING ENGINES Large or Small for flat or round rope. Double Cylinder Engines, from 6x10 to 18x60. This latter size furnished J. B. Haggin or Giant and Old Abe Co., Black Hills also Corliss Pumping Engines, 26x60, for Hoisting and Pumping Works, for 2,000 feet deep. **Baby Hoists for Prospecting, 4 H. P. to 6 H. P.**

Frue Ore Concentrator, or Vanner Mills.

Coarse Concentrating Works, Improved Jigs, Crushing Rollers, Sizers, Trommels, Rittenger Tables, and all other adjuncts for the proper working of Gold, Silver and Copper Ores, complete in every detail.

HALLIDIE IMPROVED ORE TRAMWAYS. We refer to Gen. Custer mine, Idaho, 5,000 feet long; Columbus Mine, Col., 4,750 feet long; Mary Murphy mine, Col., 5,000 feet long, all in constant operation.

LEACHING MILLS,

Improved Corliss and Plain Slide Valve Meyer's Cut-off Engines.

CORLISS ENGINES from 12x36 Cylinders to 30x60. PLAIN SLIDE VALVES from 6x10 to 36x36. BOILERS of every form, made of Pine Iron Works C. H. No. 1 Flange Iron, or Otis Steel. Workmanship the most careful. All Rivets Hand Driven.

Wire Rope, Safety Cages and any Size and Forms of Cars. **McCaskell's Patent Car Wheels and Axles—Best in Use.**

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F. A. HUNTINGTON,
SAW, SHINGLE, AND QUARTZ MILL MACHINERY.

We Call Attention to the Following Testimonials as to the Capacity and Durability of the Centrifugal Roller Quartz Mill:

SAN FRANCISCO, Dec. 27, 1883.

Mr. F. A. Huntington, San Francisco, Cal.—DEAR SIR—The four-foot Centrifugal Roller Mill, bought of you in August, 1882, for the Whidden Gold Mining Company, of Shingle Springs, has given entire satisfaction, both on our own and on custom work, saving from 85 to 90 per cent of the gold in the mill. In conclusion I will say that we are so well pleased with it that Mr. Whidden and myself are putting one of the same size on the Tohongo gold mine, near Ravenna, in Los Angeles county.

Yours truly, P. YEASEY,
34 California St., S. F.

FINE GOLD GULCH, Nov. 10, 1883.

Mr. F. A. Huntington, San Francisco, Cal.—DEAR SIR—In reply to your inquiry concerning the working of your Centrifugal Roller Quartz Mill, I am pleased to say that I run one of them for seven months, doing custom work on different varieties of rock, and that the mill gave satisfaction in every respect, and did all that you claim for it.

Yours truly, BYRON JENNINGS.

GARIBALDI MINE, Dec. 17, 1883.

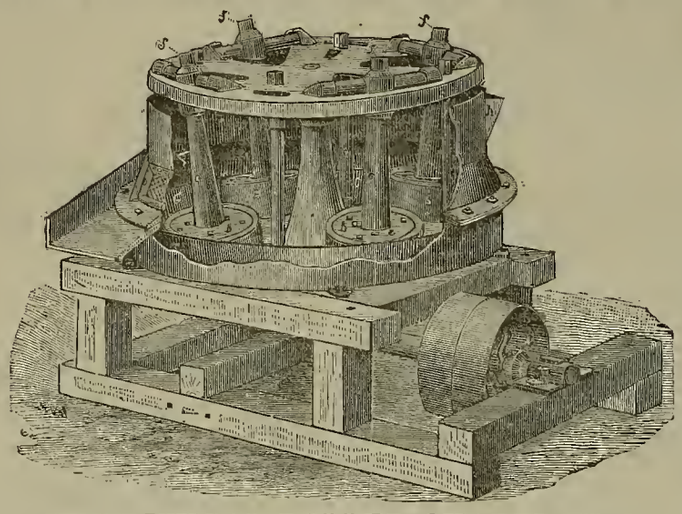
F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR—In reply to yours of the 10th inst., I take pleasure in assuring you that your Centrifugal Roller Quartz Mill gives entire satisfaction, and I can heartily recommend it to mining men who want a cheap and efficient crusher.

Yours truly, E. I. PARSONS, Supt.

32 WASHINGTON AVENUE,
SAN FRANCISCO, Dec. 29, 1883.

F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR: Having run one of your Centrifugal Roller Quartz Mills on sample lots of rock from more than twenty different mines, I must say that in every instance it has given the best of satisfaction in every particular; and I recognize its superiority over any other mill manufactured.

Very truly yours, D. O. MOWRY.



CENTRIFUGAL ROLLER QUARTZ MILL.

The work done by the Centrifugal Roller Quartz Mill, during the past two years, on various mines and different kinds of rock, PROVES ALL THAT IS CLAIMED FOR IT, viz.:

1. The cost of same capacity is not more than one-half that of stamps.
2. Freight to mine one-fourth that of stamps.
3. Cost of erection at mine one-tenth that of stamps.
4. It runs with one-third the power per ton of ore crushed.
5. The wear is less than that of stamps.
6. The wearing parts are easily duplicated.
7. It has a much better discharge, and leaves the pulp in better condition for concentrating.
8. It is a better Amalgamator, saving fully nine-tenths of the gold in the mill; the balance can be saved on plates in the usual manner.
9. It is continually crushing; not like the stamp, using power to suspend it in air ninety-nine one-hundredths of the time and the balance making a thundering noise, and accomplishing *comparatively* small results. It is as far in advance of the stamp mill as the present method of making flour with improved rolls is over the Indian's mode of crushing corn in a stone mortar.

PATTEN'S CONCENTRATOR.

This machine requires less power, less care or attention, and is less liable to get out of repair than any concentrator now in use; all of which any practical miner will comprehend when seeing it in operation.

SONORA, CAL., Dec. 1, 1883.

F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR:—In reply to yours of recent date, inquiring about the Centrifugal Mill which I bought of you, I will say that I have run the mill four months on hard rock; and I take pleasure in adding that the mill has in every way given the best of satisfaction.

Yours truly, J. H. NEALE.

GARIBALDI MINE,
Calaveras Co., Cal., Dec. 17, 1883.

F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR:—In answer to your inquiry concerning the working of the five feet Centrifugal Mill, bought of you for the Garibaldi mine in Calaveras county, I take pleasure in saying it gives entire satisfaction in every respect, and I only regret that the mine does not warrant the purchase of more of them and the continued use of the one now in operation.

Very truly yours, O. B. SMITH.

F. A. Huntington Esq., San Francisco, Cal.—DEAR SIR—Your Centrifugal Roller Quartz Mill has run on the Whidden Gold Mining Co. property at Shingle Springs, El Dorado Co., Cal., about four months, and it has done good and satisfactory work, a greater proportion of gold remaining in the mill than in the stamp battery. FRED JONES, Supt.

HILDRETH RANCH, Fresno Co., Cal.,
January 11, 1884.

F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR—In regard to your mill (Centrifugal Roller), I have crushed about 500 tons of rock in the mill, and am glad to say that it has given entire satisfaction, and can recommend it to the public as the most expeditious and least expensive method for crushing and milling ore that I have ever seen. Truly yours,

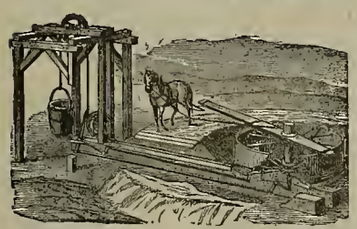
THOS. HILDRETH.

MILLS ERECTED WITH ALL APPLIANCES COMPLETE. CAPACITY AND DURABILITY GUARANTEED

F. A. HUNTINGTON, 45 Fremont St., San Francisco.

☞SAMPLE LOTS OF ORE WORKED.☜ ☞WHERE A MACHINE CAN BE SEEN IN OPERATION.☜

MINERS' HORSE WHIM.



ONE HORSE CAN EASILY HOIST OVER 1,000 LBS. at a depth of 500 feet. The Whim is mainly built of wrought iron. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending the bucket. The standard of the whim is bolted to bed-timbers, thus avoiding all framework. When required, these whims are made in sections to pack on mules.

120 in Actual Use.

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NEW ERA DUPLEX STEAM PUMP

For Every Kind of Service.

THIS PUMP HAS TWO DOUBLE-ACTING PLUNGERS.

Never Sticks. Always Ready to Start.
No Auxiliary Valves to get out of order.
No Noise. Can be run Fast or Slow.

WE GUARANTEE a greater capacity for less money than any other Pump in the market. ☞Send for DESCRIPTIVE CIRCULAR and PRICE LIST to

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J. W. QUICK, Prop'r.

Sheet Metals of all kinds perforated for Flour and Rice Mills, Grain and Malt Driers, Furnaces, Chess, Cement and Smut Mills, Separators, Revolving and Shot Screens, Stamp Batteries, and all kinds of Mining and Milling Machinery. Inventor and manufacturer of the Celebrated Slot Cut and Slot Punched Screens. Mining Screens a Specialty, from No. 1 to 15 (fine).

☞Orders Promptly Executed.

A Great Triumph!

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GOULD & HILL, Proprietors,

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On the 25th day of August, 1884, Judge Sabin, of the United States Court of Equity, decided the great infringement case of the Sa'amanda Felting Company of New York and Philadelphia vs. the EUREKA CEMENT, in favor of the EUREKA CEMENT. This decision is one of the most important that has been rendered for many years, because it gives Messrs. GOULD & HILL the unrestrained right to continue the manufacture of the BEST COVERING FOR STEAM BOILERS AND PIPES that is known to the world.

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All kinds of Quartz Screens, slot or round holes; zinc, copper and brass for flour and other mills. BOOK & WAGNER, 123 and 125 Beale St., S. F.

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THE CHEAPEST AND BEST
STEAM PUMP for Lifts from 10 to 70 ft.
FOR IRRIGATING PURPOSES
And all General Work where a Simlpe Durable Pump is Required.

NO VALVES! NO PISTON!
NO OIL REQUIRED!

Can be Run by a Child.

EACH PUMP GUARANTEED.

PRICE—One-tenth of an ordinary Steam Pump, same apacity.

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Manufacturer of all kinds of **Chemical Stoneware**
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Also Chemica Brick for Glover Tower.

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Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in bnilding. Apply at the Company's office, 314 California street.

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In Great Variety of Sizes.

ROCK DRILL STEEL in BOND or DUTY PAID

Gold Medals Awarded at Exhibitions of Paris, 1878. and Melbourne, 1881.

Manufactory: SHEFFIELD, ENGLAND. 8 branch Warehouses throughout the United States and Canada.

Sheet Steel, Best Circular Saw Plates, Double Shear Steel, Die Steel, Etc.

As a SPECIALTY, we offer our BEST TOOL AND DIE STEEL, annealed soft. Also, ANNEALED DIE BLOCKS from Stock, or on importation ordere at Short notice.

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THE CALIFORNIA POWDER WORKS.

MANUFACTURERS OF
Sporting, Cannon, Mining, Blasting and
HERCULES POWDER

HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in nse, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fnmes, notwithstanding bombastic and pretentious claims by others.

It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

No. 1 (XX) is the Strongest Explosive Known.
No. 2 is superior to anv powder of that grade.
PATENTED IN THE UNITED STATES PATENT OFFICE.
ORDERS RECEIVED FOR HERCULES CAPS AND FUSE.
JOHN F. LOHSE, SEC'Y.
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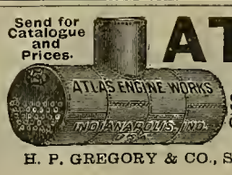
The Best LOW GRADE EXPLOSIVES in the Market.
SUPERIOR TO BLACK OR JUDSON POWDER.

Vulcan Nos. 1, 2 and 3,
The Best NITRO-GLYCERINE POWDERS Manufactured.
SPECIAL INDUCEMENTS IN PRICES.
AJAX and VULCAN B B POWDERS are Unequaled for Bank Blasting and Railroad Work.
Caps and Fuse of all Grades at Bottom Rates.
VULCAN POWDER CO.,
218 California Street, San Francisco, Cal.

—TO—
HYDRAULIC MINERS:

THE ABOVE CUT REPRESENTS OUR NEW IMPROVED GIANT, which we recommend as being the Best Hydraulic Machine ever manufactured. They are SIMPLER, LIGHTER, CHEAPER AND MORE EASILY WORKED than any style heretofore made. The machine is fully protected by patents owned by us, and we will guarantee protection to our customers.
Send for Circular and Price List.
HOSKIN & CO.,
Marysville, Cal.

Send for Catalogue and Prices.



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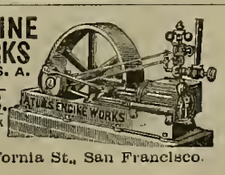
Carry Engines and Boilers in Stock for immediate delivery.



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Ores Sampled and Assayed, and Tests made by any Process.
Assaying and Analysis of Ores, Minerals and Waters.
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Practical Instruction given in Treating Ores by approved processes.
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HIGHEST PRICES PAID FOR
Gold Silver and Lead Ores and Sulphurets.

Manufacturers of Bluestone.
ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.
This Company has the best facilities on the Coast fo working
GOLD, SILVER and LEAD
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Ores worked by any Process.
Ores Sampled.
Assaying in all its Branches.
Analyses of Ores, Minerals, Waters, etc.
Working Tests (practical) Made.
Plans and Specifications furnished for the most suitable Process for Working Ores.
Special attention paid to Examinations of Mines; Plans and Reports furnished.
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CHEMICAL APPARATUS AND CHEMICALS, DRUGGISTS' GLASSWARE AND SUNDRIES, ETC.
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We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.
Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price. Our New Illustrated Catalogue, with prices, will be sent on application.
Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application. Agents for the Patent Plumbago Crucible Co., London, England.
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NICKEL and COBALT.
For Sale
12 LARGE CLAIMS, going from 14 per cent. up to 45 per cent. Situated in Cottonwood, Churchill county, Nevada, 40 miles east from Lovelock Station, C. P. R. R., Nevada, U. S. Ore is being shipped by car-load to London, England. Apply to
GEORGE LOVELOCK,
Lovelock, Nevada, U. S.

San Francisco Cordage Factory.
Eetablished 1856.
Constantly on hand a full assortment of Manila Rope, Sisa Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.
Extra sizes and lengths made to order on short notice.
TUBBS & CO.
611 and 613 Front St, San Francisco.

Mining Share Market.

The fact that they have commenced cross-cutting in Hale and Norcross did not seem to help the price of the stock to any extent. The stock market generally has been rather slow, and it appears hard to give it any sort of a "lift." On the Comstock, at the north end, the deep winze in Mexican is now below the 3300 level and the sump is completed and the work of cutting out a station commenced. Next in order will be the running of a west cross-cut at the great depth of 3300 ft below the surface. In the old bonanza mines a drift is being run north on the 1700 level to explore a section of ground lying north of where the bulkheads were built at the time of the breaking out of the fire in the old timbers. At the Chollar and Potosi work has been discontinued on the 2800 level and the sinking of the Combination shaft has been resumed. The shaft will be sunk to the 3000 level as rapidly as possible, when a new hydraulic pump will be put in at that point. This will give the finest system of pumping to be found in any mine in the world.

Bullion Shipments.

Hale and Norcross, Sept. 13, $8,339; Niagara, (Shasta Co.), 5, $16,000; Green's mine (Shasta Co.), for August, $3,500; Baltimore and Victoria (Wood River), 10, $1,454; Paradise Valley, 8, $8,918; Hanauer, 13, $9,430; Wood River, 13, $2,000; Horn Silver, 13, $9,000; Ontario, 13, $5,166; Horn Silver, 14, $6,000; Ontario, 14, $4,978; Vienna, 14, $3,167; Hanauer, 10, $9,000; Horn Silver, 11, $9,000; Ontario, 11, $6,613; Day, 12, $4,435; Baltimore and Victoria, 12, $1,938; Horn Silver, 12, $9,000; Ontario, 12, $5,236; Vienna, 12, $3,166; Navajo, 15, $12,250; Bonanza King, 10, $10,263; Belmont, 9, $2,408; Grand Prize, 15, $6,000; Bonanza King, 13, $18,343. During the week ending the 13th inst., 47 cars of bullion, weighing 1,237,153 pounds, 24 cars of ore, weighing 766,830 pounds, and one car of white lead, weighing 20,056 pounds, were shipped out of Utah.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department 10, San Francisco:

FRANKLIN COAL M. Co., Sept. 8. Location, Washington Territory. Capital stock, $250,000. Directors—Wm. Norris, Jno. D. Fry, E. W. Taggard, E. W. Sells and Sidney V. Smith.

GENERAL SHIELDS M. Co., Sept. 10. Capital stock, $15,000,000. Location, Safford district, Eureka Co., Nevada. Directors—George Hearst, A. E. Davis, Peter Hopkins, W. T. Wiggins and E. J. Swift.

CONSOLIDATED EXCELSIOR M. Co., Sept. 10. Location, Trinity Co., Cal. Capital stock, $5,000,000. Directors—P. A. Wagner, John Wagner, W. F. Perry, Frederick Getchell and Henry Boyle.

PHYSIOLOGICAL OPTICS.—A science of a very recent date, in the doctrine of the anomalies of refraction and accommodation, the connection between science and practice is more closely drawn together than in any part of medicine. Many an obscure type of disease emerged into the clearest light, and assumed, as if spontaneously, an elegant simplicity. Prof. Donders, page 329, remarks how necessary a want of knowledge it is to the correct diagnosis of the various defects of the eye, and how deeply it affects the whole treatment of the oculist, will come to the sad conviction that an incredible number of patients have been tormented with all sorts of remedies, and have been mutilated by inappropriate operations, who would have found immediate relief and deliverance in suitable "spectacles." C. Muller, the Optician, 135 Montgomery street, advises parents having children complaining of their eyes, subject to inflammation, headache, deviating in or out, as the case may be, to call. He will explain the cause and remedy of all such difficulties, very often the means of saving the loss of sight of the deviating eye, sure to follow physical exclusion. All complicated cases of defective vision thoroughly diagnosed free of charge. Every possible combination of lenses mounted in two hours notice. Correcting all errors of refraction and accommodation in simple or compound astigmatism, belonging to Myopia or Hypermetropia and Presbyopia, the result of advancing years. 3

A PLEASANT RECEPTION.—A reception was given last week at the residence of Mr. and Mrs. George H. Strong, in Oakland, on the occasion of the fifteenth anniversary of their marriage. As usual on the occasion of a "crystal wedding," the presents made were all of glass, and many of them were of beautiful and novel design. Mr. and Mrs. Strong's new residence was tastefully decorated, and their numerous friends passed a very enjoyable evening in social intercourse, with music and recitations. Mrs. Strong received many compliments for the handsome appearance of the supper table, decorated as it was with beautiful glass of varied design and color, and a test of the edibles proved her skill as a hostess. Mr. Strong has been a partner and manager of Dewey & Co.'s Patent Department for many years, and it is a matter of congratulation among all his associates and friends that the recent anniversary should have been passed in the midst of health and plenty.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Arnold G & S M Co	Arizona	2	50	Aug 1	Oct 1	Oct 28	A Judson	320 Sansome st
Atta S M Co	Nevada	30	50	Aug 21	Sept 25	Oct 15	W H Watson	302 Montgomery st
California M Co	Nevada	13	20	Aug 4	Sept 11	Oct 8	C P Gordon	309 Montgomery st
Cabarca M Co	Mexico	9	05	July 18	Aug 22	Sept 22	H C Edgerly	328 Montgomery st
Champion M Co	California	16	10	Aug 22	Sept 28	Oct 16	T Wetzel	522 Montgomery st
Con Imperial S M Co	Nevada	21	10	Sept 1	Oct 7	Oct 28	C L McCoy	309 Montgomery st
Excelsior W & M Co	California	7	50	Sept 2	Oct 7	Oct 28	W J Stewart	215 Sansome st
Eintracht Gravel M Co	California	16	05	Aug 26	Sept 1	Oct 18	H Kunz	209 Sansome st
Equitable Tunnel M Co	Utah	30	10	July 29	Sept 15	Oct 7	W A Van Bokkelen	419 California st
El Dorado Con M Co	Nevada	3	04	Aug 18	Sept 19	Oct 8	J H Sayre	330 Pine st
Enterprise M Co	California	1	15	July 1	Sept 13	Oct 4	W Van Bokkelen	419 California st
Golden Fleece G M Co	California	33	50.00	Aug 6	Sept 10	Sept 27	F Schermier	412 Sixth st
Justice M Co	Nevada	41	15	Sept 11	Oct 11	Nov 5	R E Kelly	412 California st
Martin White M Co	Nevada	18	25	July 25	Sept 4	Oct 2	J J Scoville	309 Montgomery st
Morgan M Co	California	11	1.00	July 3	Aug 30	Sept 22	C S Neal	309 Montgomery st
North Gould & Curry M Co	Nevada	7	25	Sept 3	Oct 6	Oct 23	C H Mason	331 Montgomery st
New York Hill M Co	California	8	20	July 29	Sept 2	Sept 23	J B Lightner	527 Clay st
Oleta M Co	California	1	10	July 26	Aug 30	Sept 20	T H Gancard	9th and Market st
Potosi M Co	Nevada	16	50	July 29	Sept 2	Sept 23	C L McCoy	309 Montgomery st
Savage M Co	Nevada	60	50	Sept 5	Oct 7	Oct 27	E B Holmes	308 Montgomery st
Summers Con M Co	California	1	05	Aug 18	Sept 22	Oct 16	F E Luty	330 Pine st
Summit M Co	California	7	05	Aug 4	Sept 8	Sept 29	G W Sessions	309 Montgomery st
Santa Anita M Co	California	7	02	July 30	Sept 2	Sept 22	J M Buffington	308 California st
Utah S M Co	Nevada	50	50	Aug 18	Sept 22	Oct 11	G C Pratt	309 Montgomery st

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	G W Sessions	309 Montgomery st	50	June 5
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Aug 26
Idaho M Co	California			4.00	Apr 2
Jackson M Co	California	D C Bates	309 Montgomery st	10	Mar 18
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 21
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Apr 28
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Mar 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Sept 5

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug. 28.		WEEK ENDING Sept. 5.		WEEK ENDING Sept. 11		WEEK ENDING Sept. 18.	
Alpha	1.25	1.45	1.60	2.00	1.45	1.65	1.50	1.65
Alta	2.10	2.40	2.10	2.30	1.95	2.45	1.60	2.35
Andes	....	.25	.20	.25	....	....	.20	.25
Argenta	.15	.25	....	.15	....	.15	....	....
Belcher	.85	.90	.30	.90	.80	.90	.80	.90
Belding	....	....	....	....	....	....	....	....
Best & Belcher	2.20	2.35	2.30	2.45	2.30	2.50	2.20	2.40
Bullion	....	.50	.50	.60	....	.45	....	.50
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	.70	.75	.60	.65	.55	.60	....	.55
Bodie Con	1.90	2.05	1.65	1.95	1.65	2.15	2.00	2.05
Benton	.40	.75	.50	.65	.55	.70	.50	.70
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	....	.50	....	....	....	....	....	.50
California	....	.15	.10	.15	.15	.55	.30	.35
Challenge	....	.15	.20	.25	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Chollar	1.80	2.60	3.60	3.00	2.15	2.70	2.20	2.45
Confidence	....	....	....	1.00	....	....	....	1.00
Con. Imperial	....	....	....	.05	....	....	....	....
Con. Virginia	.35	.40	.25	.35	.25	.30	.20	.25
Con. Pacific	....	.60	.55	.60	....	.60	.60	.65
Crown Point	1.30	1.35	1.30	1.40	....	1.25	1.30	1.35
Day	....	....	....	....	....	....	....	....
Eureka Con	....	....	....	2.50	....	....	2.75	3.00
Eureka Tunnel	.40	.55	....	.55	....	....	....	....
Exchequer	.30	.40	.40	.45	....	.40	.35	.40
Grand Prize	.50	.50	.50	.50	.40	.45	....	....
Gould & Curry	1.90	2.05	2.00	2.40	1.95	2.25	1.95	2.15
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	2.75	3.25	3.10	3.60	2.75	3.35	2.85	3.25
Holmes	2.50	3.00	....	....	....	2.60	....	2.75
Independence	....	.25	....	....	....	....	....	.25
Julia	....	....	....	....	....	....	....	....
Justice	.15	.25	.15	.20	.15	.25	....	.20
Martin White	....	....	....	.30	....	....	....	....
Mono	.60	.70	.60	.65	.70	.95	.90	1.40
Mexican	1.45	1.60	1.50	1.70	1.50	1.60	1.60	1.85
Mt. Diablo	....	....	....	2.25	....	....	....	....
Northern Belle	....	....	....	....	....	....	....	....
Navajo	1.00	4.15	3.50	4.15	3.60	3.90	3.55	3.90
North Belle Isle	....	....	....	....	....	....	....	....
Occidental	....	1.25	....	1.10	1.10	1.15	1.30	1.60
Ophir	1.05	1.20	1.10	1.25	1.10	1.25	1.30	1.40
Overman	.15	.20	.15	.80	.15	.20	....	....
Potosi	.95	1.05	1.05	1.75	1.35	1.65	1.35	1.60
Pinal Con	....	....	....	....	....	....	....	....
Savage	.95	1.25	1.25	1.70	1.20	1.40	1.20	1.45
Seg. Belcher	....	....	....	....	....	.10	....	....
Sierra Nevada	1.30	1.50	1.45	1.65	1.35	1.50	1.45	1.70
Silver Hill	....	....	....	....	....	.10	....	....
Silver King	4.25	4.50	....	4.50	....	....	....	4.50
Scorpion	....	.25	.25	.30	....	.25	....	.25
Syndicate	....	.45	.45	.55	....	....	....	.45
Tioga	....	....	....	.05	....	....	.25	....
Union Con	1.10	1.20	1.15	1.30	1.15	1.20	1.25	1.35
Utah	....	.95	1.00	1.15	.80	.90	.70	.95
Yellow Jacket	1.75	1.90	1.70	1.90	....	1.75	1.95	2.00
	....	....	....	....	....	....	....	....

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Sept. 18, 1884

ANTIMONY—Per pound	@	—
Hallet's	14 @	—
Cookson's	15 @	—
BORAX—Refined	8½@	9
IRON—Glengarnock ton	25 00 @	—
Eglinton, ton	24 00 @	—
American Soft, ton	25 50 @	—
Oregon Pig, ton	@	—
Clipper Gap, Nos. 1 to 4	30 00 @	32 50
Clay Lane White	22 50 @	—
Shotts, No. 1	26 00 @	—
Refined Bar	3½@	3
Boiler, 1 to 4	5 00 @	5 50
Plate, 5 to 10	4½@	4¾
Nail Rod	7½@	—
Norway, according to thickness	6½@	7½
STEEL—English, lb	16 @	25
Black Diamond, ordinary sizes	14 @	—
Drill	15 @	—
Machinery	12 @	14
COPPER—Ingot	15 @	16
Braziers' sizes	16 @	25
Fire-box sheets	28 @	37
Bolt	23 @	25
Old	12½@	15
Bar	— @	—
Cement, 100 fine	12 @	—
Copper in New York, Sept. 3	13½@	13¾
LEAD—Pig	3½@	4
Bar	5½@	—
Pipe	7 @	—
Sheet	8 @	—
Shot, discount 10% on 500 bags: Drop, ₱ bag.	2 00 @	—
Buck, ₱ bag	2 20 @	—
Chilled, do	2 40 @	—
TIN PLATES—Charcoal	7 00 @	7 25
Coke	5 75 @	6 75
Pig	19 00 @	20 00
Banca tin	22 @	23
I. C. Charcoal R oofing, 14x20	6 25 @	6 50
ZINC—By the casks	9½@	—
Sheet, 7x3 ft, 7 to 10 lb, less the cask	9 @	10
QUICKSILVER—By the flask	30 00 @	—
Flasks, new	1 05 @	—
Flasks, old	85 @	—

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Sept. 18.

820	Alta	1.65@1.70	
1085	Alta	1.70@1.80	
700	Andes	.20c	
100	B. & Belcher	2.15	
200	B. & Belcher	2.20	
1500	Benton	.50@55c	
1150	Benton Con	.50@55c	
170	Bodie	1.95	
50	Belle Isle	.55c	
500	Chollar	2.10	
470	Bodie Con	2.10	
50	Grand Prize	.40c	
45	California	.30c	
750	Hale & Nor	2.85@2.90	
800	Hale & Nor	3.15	
1000	Mono	1.05@1.10	
200	Mexican	1.60	
50	Mexican	1.50	
500	Mono	1.30@1.35	
220	Ophir	1.30	
250	Ophir	1.30	
500	Overman	.20c	
550	Overman	.15c	
350	Potosi	1.30@1.35	
770	Potosi	1.40	
700	Savage	1.25	
350	Savage	1.35	
200	Sierra Nevada	1.40	
100	Syndicate	.45c	
100	Union	.75c	
50	Utah	.75c	
40	Utah	1.25	
50	Union	1.30	
100	Alpha	1.55	
100	Yellow Jacket	1.75	

AFTERNOON SESSION.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
J. J. BARTELL—Sacramento Co.
A. C. KNOX—Nevada (State.)
B. W. CROWELL—Fresno and Tulare counties
GEO. MCDOWELL—Plumas and Sierra counties.
WM. PASCOE—San Francisco.
WM. H. COOK, Los Angeles Co.
H. G. PARSONS—Idaho and Montana.
G. W. IOALLS, Arizona.
H. A. BEATON—Washington Ty.
L. L. WOODMANSEE—Oregon.
J. C. KOOP—Napa Co.

Red Canyon Quartz.

EDITORS PRESS:—Some very rich gold quartz was recently brought into Genoa from Red Canyon, Douglas county, Nevada, a full account of which has been promised in a short time for your columns by one familiar with the rock and the district. About 35 miles from Carson City, on the wagon road to Aurora, Mr. Holbrook, of the Mountain House, and others, are opening up some promising claims in Silver Glance district. The Orpheus mine, the property of Messrs. Willard & McDonald, has thus far paid all expenses, and, as will be seen, the developments are by no means inconsiderable, with a tunnel 140 feet in length and an incline on the lode of at least as many feet, besides other work. The mine is in a porphyry formation; width of lode averaging about 18 inches; ore free-milling gold quartz, the best working from $150 to $250 per ton; the poorer averages from $25 to $30. K.

Genoa, Douglas Co., Nev.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First street, a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below costs, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. References as to above can be had upon applying to this office.

MR. L. L. WOODMANSEE has gone on a trip through Oregon in the interests of this paper. The editors and publishers will feel greatly obliged to all friends who may assist him in obtaining information and subscribers. Mr. Woodmansee is an experienced canvasser, who has formerly traveled for this firm in the interests of the journals published by it, and will send such notes as he gathers for publication.

BOUND VOLUME OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce, and valuable for future reference and library use.

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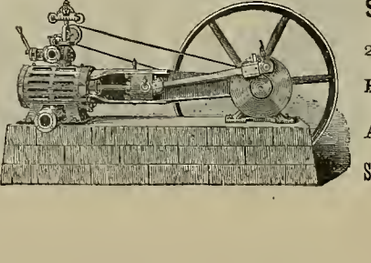

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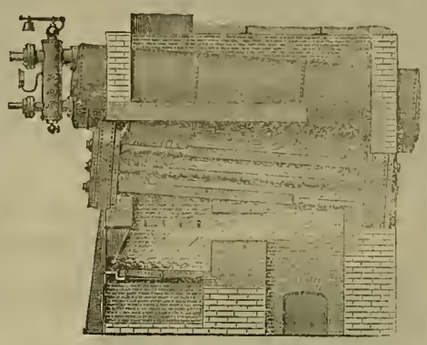


TESTIMONIALS.

ST. LOUIS, MO., Sept. 26, 1883

Messrs. Adolphus Meier & Co.—GENTLEMEN. We cheerfully certify that the "*Heine Patent Safety Boiler*" put up by you in our establishment has proved very satisfactory in its working The chief points of excellence in the "Heine Safety Boiler" are its economy in fuel and space, freedom from scaling, aptitude for power and heating purposes, working equally well with clear and muddy water. We warmly recommend it to all using steam machinery. Yours truly,

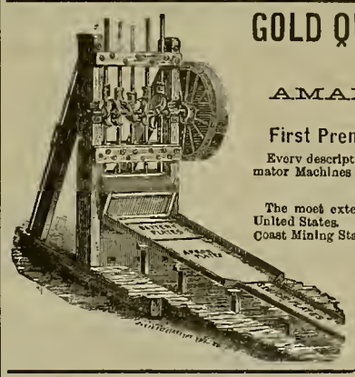
ANHEUSER BUSCH BREWING ASS'N.

OFFICE OF SUPT OF ROYAL RAILWAYS,
BERLIN, Sept. 23, 1883.

To Mr. H. Heine, Civil Engineer: In reply to your inquiry of September 24, we respectfully inform you that the three boilers built under your patents, under steam since September 25, 1881, at the Alexander Place Depot, as well as the two at Friedrich Strasse Depot, under steam since September 22, 1882, have given good satisfaction, requiring no repairs whatsoever to date. The internal cleaning of the boiler was always accomplished with ease on account of the convenient arrangement of the tube caps, the adhesion of scales being fully prevented thereby, and the boilers kept in prime condition.

(Signed): BRAUCKE.

Send for Circular and Prices.



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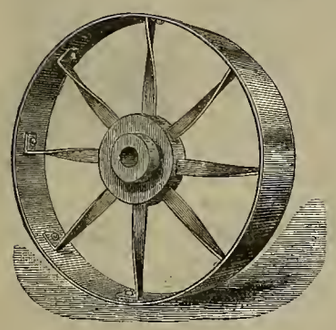
—PATENT—
STEEL PULLEY.



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On account of their great lightness and the form of the arms, they absorb less power than any other pulley.

They are *the only pulley of the kind* which runs true. They cannot be broken in transport.

TESTIMONIAL:

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N. Macbeth, Esq.—Dear Sir: The Patent Steel Pulleys supplied throughout to our No. 2 Mill are working to our entire satisfaction.

They are very true, and are about 50 per cent lighter than the cast-iron pulleys in our No. 1 mill.

Yours faithfully,
For the Mather Lane Spinning Co. (Limited),
[Signed:] RICHARD T. MARSH,
Managing Director.

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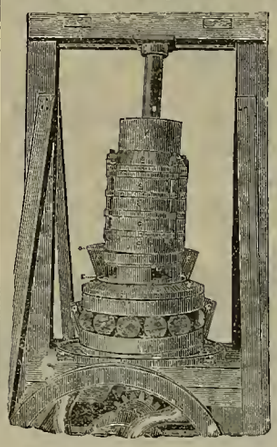

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4. Not more than one-half the space is required—a point of great importance where a considerable number are used.
5. No special skill and very little care is necessary to operate it.
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9. It has no small and delicate mechanism, requiring nice adjustment and the closest attention—an insuperable objection to all belt and other forms of machines, making them wholly unfit for the rough service of a quartz mill.
10. Great simplicity of construction and small number of wearing parts. The whole machine is comprised in 17 pieces, only 3 of which are subject to any especial wear, and these can be replaced at a nominal cost. The Frue has 113 pieces, and some similar machines many more, making a complication of parts that involves constant repair and great expense in this way, as well as in loss of time.

We are aware that the most sweeping and pretentious claims are made for nearly every concentrator in the market, but it is a well-known fact that the results of their operation have not in any instance made good these claims. The advantages here set forth for the Duncan, as well as the statements made, we are prepared to substantiate by actual working results. **Price, $350. Weight, about 1,750 pounds.**

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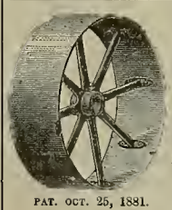

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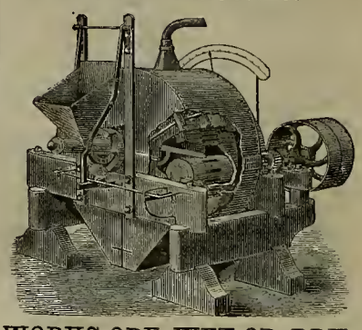

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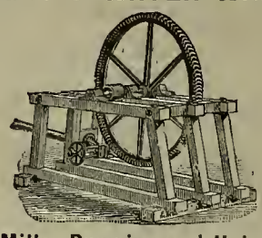

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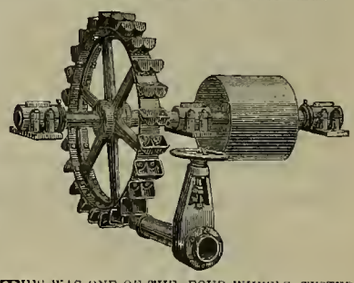

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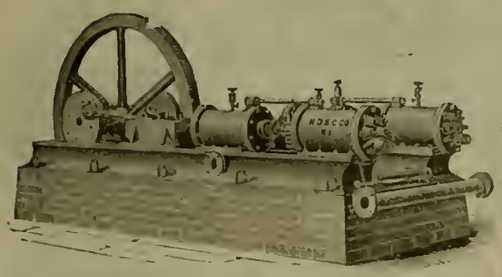

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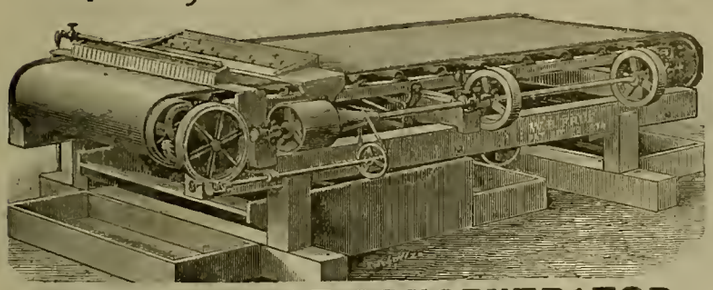

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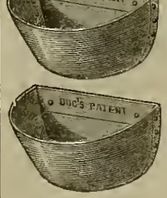

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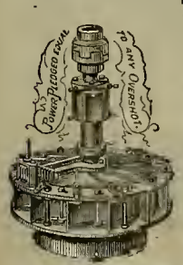

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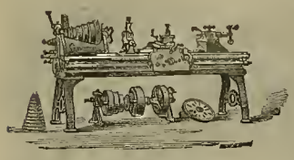

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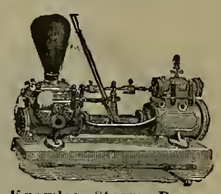

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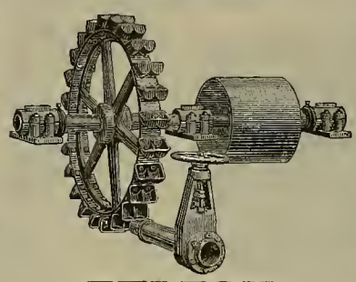

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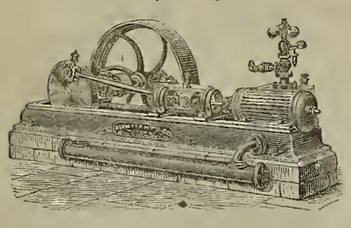

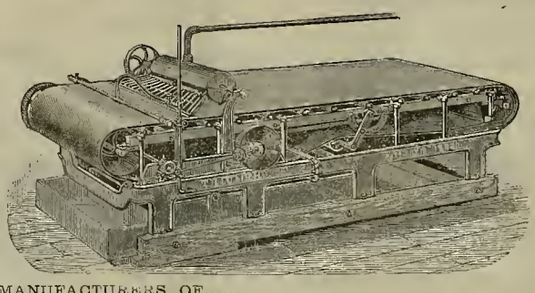

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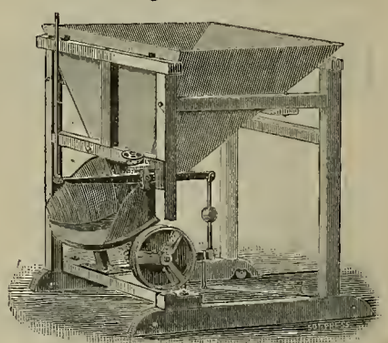

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, SEPTEMBER 27, 1884.

VOLUME XLIX. Number 13.

The Big Alaska Quartz Mill.

We give on this page and page 197 engravings of the new mill of the Alaska Mill and Mining Co., which is about to be erected on Douglas island. The plant is one of the most complete ever built in this country, comprising as it does every improvement in quartz mill machinery. The mill was designed by the company's superintendent, Mr. John Treadwell, and built by the Risdon Iron Works, of this city. The machinery was shipped a few weeks since to Alaska, and the men are by this time engaged in setting it up, preparations for the reception of the machinery having been made during the summer.

The mill is designed for the reduction of gold ore carrying sulphurets and free gold, and has 120 stamps of 900 pounds each, with a crushing capacity of 360 tons per day.

As will be seen, the batteries are arranged in two lines, setting back to back, with the ore bins between, on the top of which are three 9-inch by 15-inch Blake rock breakers, and six 5 feet by 10 feet grizzlies. In front of the batteries and in the battery-room are copper-plate sluices, and in front of the battery-rooms and below are the concentrator-rooms. In the battery-rooms, in convenient positions, are placed the cleaning-up pan and amalgamating barrel. At the end of the concentrator-room the water-wheels for driving the machinery are placed, the whole arrangement being designed to make the mill as nearly automatic as possible, in order to save labor in running expenses, which is a very important item in a country where labor is dear, like Alaska.

The machinery is designed and constructed for durability, and with all of the latest improvements, with steel cams, tappets, shoes and dies. The mortars are made of an improved pattern, weighing 6,000 pounds each, with cast-iron linings arranged specially for the amalgamation of free gold. The stamp-stem guides are made with cast-iron frames, arranged so that any one stamp can be removed without disturbing the others, each stem being guided and held in place by separate maple blocks. This will save very much time and expense in repairing and replacing stamps.

Each battery of ten stamps is driven from the line-shaft by an improved friction clutch pulley, so arranged that each ten stamps can be started and stopped at pleasure. They are fitted with phosphor bronze bushings, and accurately balanced so that there is no tendency to "wobble" or wear out of true.

The motive power is furnished by two hurdy-gurdy water wheels—one of Pelton's patent and the other of Knight's. They are each 6 feet in diameter, and run at a velocity of 236 revolutions per minute; the power being transmitted by twelve hemp ropes 2 inches in diameter, running over grooved pulleys 12 feet in diameter. Either one of the water wheels is of sufficient power to drive the mill.

As the method of driving the machinery is novel, we shall give further illustrations next week, and describe more fully this portion of the machinery.

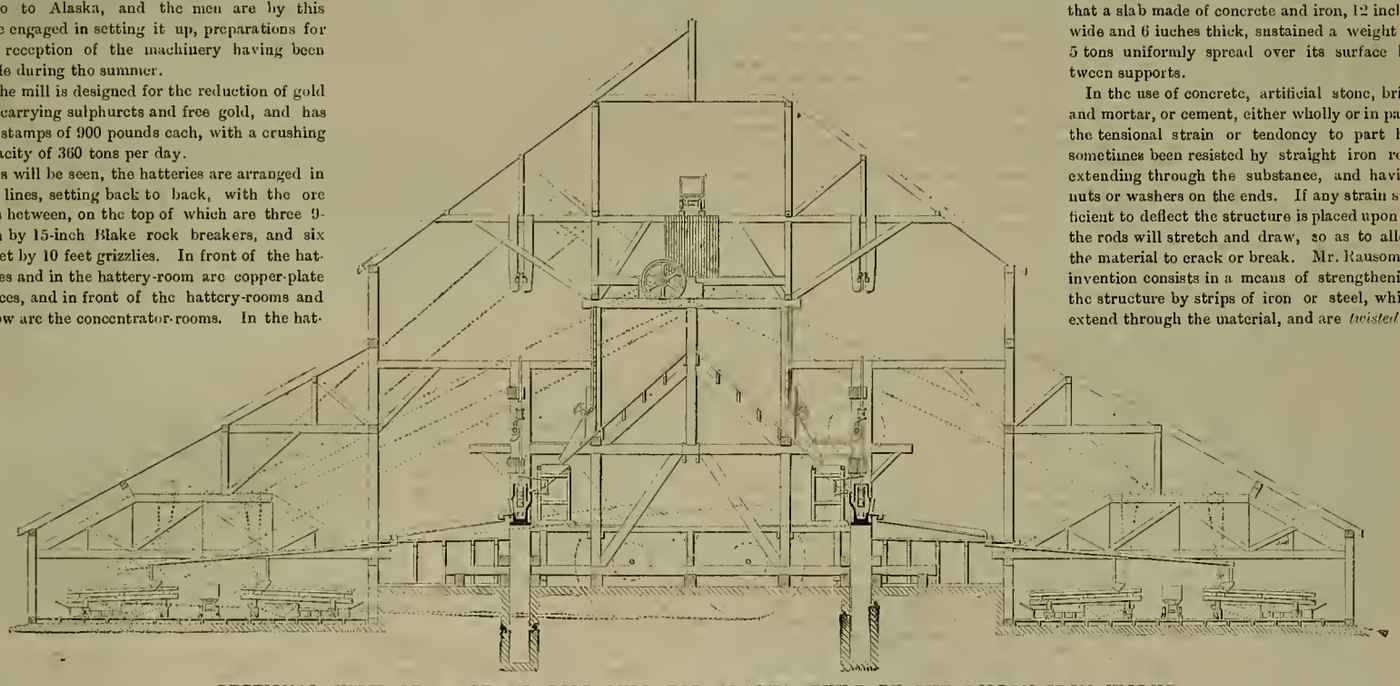
The ore is taken from a tunnel in the side of the mountain and run into the top of the mill, which is on a level with the mouth of the tunnel; here it is dumped and goes through the grizzlies and rock breakers into the ore bins, from which it is drawn out directly into the ore feeders, which feed it into the batteries, where it is crushed wet and amalgamated for free gold. From the mortars the pulp is taken over copper-plates, where any free gold which may escape is amalgamated. Then from the copper-plates it is taken to, and passed over the Frue concentrators, which save the sulphurets and the tailings, and sluiced off. From the concentrator room the sulphurets are taken to the chlorination works (which are not illustrated in the cut), where they are treated for the gold which they contain by the chlorine gas.

Some idea of the magnitude of the plant for concentrating the ore may be inferred from the fact that 48 Frue concentrators were purchased for the mill from the agents in this city. This is the largest single order the Frue agents ever received, and the largest number of concentrators in any mill in the world. This is a most substantial recognition of the merits of this machine, to which the mining industry of the country is specially indebted for the successful and economical treatment of gold-bearing sulphurets. These concentrators are arranged in double rows in the concentrating room, for economy of space and attendance.

The San Francisco Plating Works furnished for this mill 1,400 square feet of silver-plated amalgamating plates. Some of these plates are 4x4 feet and some 2x2 feet; the mortar plates are 6x48 inches. This is the largest single order, with one exception, that Mr. Denniston ever received.

The mill will be illuminated by several powerful electric lights, which will diffuse sufficient light to enable work to be carried on with the same facility in the night as in the day time.

The contract called for this mill to be finished in 60 days, but the Risdon Iron Works completed it in less than 50 days. The Alaska Mill and Mining Company is composed of some of the most prominent business men of the Pacific coast. James Freeborn is the president of the company. Col. J. D. Fry and Senator John P. Jones are stockholders. John Treadwell, who is renowned for his executive ability and energy, is the superintendent.



SECTIONAL VIEW OF 120-STAMP GOLD MILL FOR ALASKA, BUILT BY THE RISDON IRON WORKS.

New Form of Building Construction.

Mr. Ernest L. Ransome, of this city, has just patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, a new form of building construction, which he is applying at several places in San Francisco. It is essentially the strengthening of concrete, artificial stone, or similar material, by the use of iron. The roof of the new fire-proof warehouse now being made by Mr. Ransome will be built with this construction. Experiments have demonstrated that a slab made of concrete and iron, 12 inches wide and 6 inches thick, sustained a weight of 5 tons uniformly spread over its surface between supports.

In the use of concrete, artificial stone, brick and mortar, or cement, either wholly or in part, the tensional strain or tendency to part has sometimes been resisted by straight iron rods extending through the substance, and having nuts or washers on the ends. If any strain sufficient to deflect the structure is placed upon it, the rods will stretch and draw, so as to allow the material to crack or break. Mr. Ransome's invention consists in a means of strengthening the structure by strips of iron or steel, which extend through the material, and are *twisted* so that they are fixed within the material at every point from end to end, and a rigid bond is thus formed throughout the entire length, the tendency of the iron to stretch or draw being resisted at every point in its length.

The concrete or artificial stone structure has the rods put in before it becomes solid from the plastic state. When there is any strain and tendency to deflect, the tensional strain brought upon it may reach the point of rupture. If straight rods or ribbons extend through, they often crack, as their even size allows them to slip within the structure. Mr. Ransome's rods or strips being twisted, by their spiral shape they form a bond or tie at all points, from end to end, within the material through which they pass. The principal advantage arises from the bond which is formed at every point by the peculiar shape of the rods or strips. Repeated experiments with different forms of rods show this spiral or twisted form to be best adapted to the purpose required.

SALE OF MEXICAN MINES.—A dispatch from Guaymas, Mexico, says: One of the most important sales of mines has just been concluded at Magdalena, through our Consul, A. Willard. The property sold is the Trinidad mine, and land in the Tahecripi district, and the Bronces, with coal lands in Ures district. The purchaser is James T. Browne, of Browne Bros. & Co., bankers, London. Alex. M. Womble was mainly instrumental in engaging English capital in this purchase. The price to be paid is $1,500,000 in gold, on or before January 1, 1886. There are no less than fourteen miles of tunnels and drifts on this property, and it is the largest mine in Mexico. Work on it will be immediately commenced.

A GREAT amount of prospecting is being done about Sweetwater. In that vicinity is a very extensive mineral belt. Of late several good strikes have been reported.

WORKING TAILINGS.—D. W. Johnson and John Boyer, both practical mill men, have purchased some 60,000 tons of tailings from Booth & Co., owners of the Arizona mine, at Unionville. The purchasers have also bought the two quartz mills owned by Booth & Co., and will go to work immediately to get them in order to work the tailings.

Support Your Own Mechanics and Manufactories.

The citizens of Denver, Colorado, are taking a lively interest in the support of their home manufactories. This is as it should be, and we congratulate the mechanics and manufacturers of that city that her citizens have a just appreciation of the value of encouraging and building up home industries. They have come to a very general determination not only to patronize their own manufacturers but also refuse to patronize such of their home dealers, as refuse to place upon their shelves, or in their warehouses, the goods that are produced at home. These facts, as the Denver *Journal of Commerce* truly says, speak well for the patriotism and good business sense of the people of that city.

This disposition is worthy of emulation by our own citizens—not only of San Francisco, but of the whole State as well. It is a good policy for adoption by city, State, or nation. It is the only way in which thriving and prosperous communities can be built up. Transportation of goods from one place to another in which goods of an equal quality and at essentially the same price can be produced, creates no values. It is labor lost, in fact, it is labor worse than lost. It is a suicidal policy; for the inevitable result is to decrease the volume of business at home, and swell that at some other place at the expense of your home industry upon which your own, and every other family in your neighborhood, depends. Every dollar spent at home, instead of being sent abroad, helps the trade of your neighborhood that much—it passes from one dealer to another and thereby increases the volume of local business.

There will necessarily be certain locations peculiarly calculated for certain lines of production—that is well; but all cost of transportation beyond the necessity thus created is lost labor, because if not thus employed it would be devoted to creating values and thereby increasing the general aggregate of State and national wealth.

It is gratifying to see the interest that has sprung up of late in this city and throughout the State generally on the subject of home manufactures. There are a large number of new enterprises which of late have been started or for which active steps are in progress. Among these may be mentioned several new lines of iron manufacture, a new line of glass work, jute, cement, cotton, India rubber, etc. The Manufacturers' Association is an organization from which much good in this direction may be expected; also the "Millers' Association of California." Through these associations and in other ways, the subject of home manufactures is being brought more prominently before the public. The Chamber of Commerce, the Manufacturers' Association and the Board of Trade have each appointed a committee of three to act in concert to discuss the business outlook in this city, and to procure an active co-operation of the business community in devising and carrying out methods for the revival and increase of our domestic trade and industries. This is a most excellent move in the right direction and by the right men. The committee have had several meetings, a part of which have been held in private. All that has thus far transpired is that the committee mean business, and that active steps will be taken to further the ends in view.

The press, generally, is also doing much to awaken our people and impress upon capitalists the value and importance of establishing new branches of industry in California, and enlarging the facilities of those already in operation.

There is a much better condition of feeling existing between the employer and employees in this State now than has existed in years past. The former, perhaps, are more liberal, and the latter realize more fully the peculiar condition in which this coast is placed in its efforts to render itself independent of Eastern producers and manufacturers. That class of men who furnish the bone and sinew to keep in motion the wheel of industry are more disposed than formerly to work in harmony with such capitalists as are disposed to invest their money in commendable efforts to build up new and important industries in our midst—industries, the success of which are really of more importance to the mechanics and laborers themselves than to those who furnish the money to carry them on. The man or men who would unnecessarily stir up strife, or force or augment strife between the two classes, are the enemies of both, and deserve the severest censure from better people everywhere.

But the chief object we have in view in penning this article is to impress upon the minds of the consumers of all kinds of produce and merchandise the advisability and importance of patronizing home industry. Whatever capital, whatever energy and enterprise, is put into industries on this coast, is of benefit to all our people, and both, the men who place therein their capital and those who invest their labor and strength, merit the fullest and most unstinted support of the community. They should receive aid and practical encouragement from every person who has a dollar to spend or a dollar's worth of interest in this city or State.

THE introduction of cable cars is now proposed by a Pittsburg railway company.

Mining Outlook in Utah.

A correspondent of the Salt Lake *Tribune* says: Since mining is the principal industry that puts money in circulation in Utah, on which depends the success of our mercantile, manufacturing and agricultural interests, and in fact nearly all the business pursuits of the Territory, our business men and local capitalists should manifest a deep interest in the development of our mineral resources.

As a rule, the business men of a mining region realize the benefits that will accrue to their business by a development of the country's mineral resources, are liberal in encouraging the prospector and miner in their work of development, but here in this city, the metropolis of Utah, where the largest mercantile and manufacturing establishments are located, our business men and local capitalists seem to manifest but little interest in the development of our mineral resources, notwithstanding the fact stares them in face that 90 per cent of the money that circulates in Utah, which enables the merchant to do a profitable business, gives the farmer a cash market for his produce, enables the borrower to pay the loaner an exorbitant rate of interest for the use of money, makes it possible for our local railroads to be operated at a profit, must come from the mines.

We have a few energetic men who are mining on a legitimate basis, a basis of actual values, and they are making a good success.

There are many openings here in Utah for such mining enterprises, and it would be far better for the Territory if such mining was the rule and not the exception.

The continued success of such mining will result in good to the Territory, for capitalists, seeing the fact demonstrated that mining is just as legitimate a business and as safe and profitable as any other under honest and competent management, will realize the fact that mining is a safe investment for capital and will invest liberally in ligitimate mining enterprises.

We have a few incorporated companies that were fortunate in the selection of their management and they have made a grand success of mining. They have developed their properties from mere surface prospects to large dividend paying mines.

Then we have several good mines incorporated, generally limited, that should be making an output of from $50,000 to $75,000 per month that are lying idle, and why? simply on account of incompetent or dishonest management, by which the treasuries of the companies were bankrupted, the share holders becoming disgusted and refused to make further advances to develop and work their properties. A great deal depends on the management of a mining property. We have bad managements in Utah that would bankrupt the Ontario or Horn Silver in six months.

The mining industry of Utah has had many obstacles to contend with. The great majority of the people of the Territory are hostile to it; the railroads have discriminated against it; the hue and cry that property was not safe here on account of the hostility of the Mormous; the numerous frauds and swindles that have been perpetrated by unscrupulous operators on capital that sought investment in our mines, and the systematic blackmailing of good properties; all of these have had a tendency to deter capitalists from investing in our mines. Notwithstanding all these obstacles, Utah has made a good showing. She has produced some $80,000,000 in treasure, which has made it possible to build and operate six or seven local railroads in the Territory; built up and sustained large mercantile and manufacturing establishments, from which large fortunes have been realized; brought this city from a mere country village to a city of large commercial interests, with many of the modern improvements found in larger cities—street railways, telephone, electric light, etc. With the limited number of mines now being worked, we are still making a good showing, for we have a few as good mines as can be found in the Western States.

It is not for the lack of mines that our output is not larger, but the want of a little capital in the hands of honest and competent management. We can't expect Eastern and foreign capitalists to come here and purchase undeveloped mining prospects at what the owners consider their prospective value.

When a man invests his money he wants to see a reasonable probability of getting a remunerative return for his investment; hence, in order to induce capitalists to invest in our mines we must make some developments to demonstrate at least that our mines possess a prospective intrinsic value sufficient to warrant further developments. But how is this to be done? As a rule the men who wear their lives out climbing the rugged mountains prospecting for mines are poor and unable to develop their prospects without assistance.

They naturally look for assistance from those who are to be benefited by such developments, but they look in vain in this penny wise and pound foolish community.

The present stringency in money matters would not be felt so keenly if we had more capital invested in our mining industry producing and disbursing large amounts of money to circulate through the arteries of trade. Something must be done to infuse new life and energy in our mining industry or Utah will soon lose her prestige as a great bullion producer, and some of her short-sighted business men will have to hunt new places to open up business.

I certainly wouldn't advise our business men to invest in all the mining schemes that are floating around, for many of them are of the wildcat species, but there are legitimate ventures offered occasionally indorsed by practical and competent miners that should receive encouragement by a small investment at least to demonstrate to our Eastern friends and English cousins that we haven't lost faith in the mineral resources of our Territory. If our business men and local capitalists would organize a company, under proper management, to develop and partially develop mines that have a prospective value, and demonstrate to outside capital that our mineral wealth is not confined to the few bonanza mines we are now working, but that the mountains are full of them, it would bring capital to Utah, and create a boom such as we never had before. Utah is a good field to operate in, but she needs a few live men to bring her to the front.

The Little Rockies.

From a gentleman who has just arrived from Benton we learn of the intense excitement now agitating that section of the country over the discovery of unprecedentedly rich diggings 135 miles east by north from the river metropolis of Montana. Professional men, merchants, laboring men, sports, gamins and newspaper men gather on the streets and strain their eyes for the coming of the next courier from the scene of the find, or in excited knots discuss the latest arrived bulletins. The citizens of Benton some days ago sent out a committee, consisting of Perry Aspling and Dennis Halpin, to the new fields, who were to report on the exact state of affairs. From them most flattering reports have come, such as a pit 20 feet square and 4 feet deep yielding $300, and a claim some distance from the discovery in which $36 was panned out in one day.

Our informant had an interview with Frank Aldrich, formerly of the Barker district, who had just returned from the new camp for supplies. From him he learned that the new mines were located near the head of Beauchamps creek, a tributary of the Missouri, and the first stream of importance east of Little Rocky creek, the latter emptying into the Missouri opposite Rocky Point. The gulches tributary to the discovery gulch have yielded good prospects, and there are several bar claims, but the amount of water available for the latter is small, although he thinks water could easily be brought in. In the discovery gulch they have at present about 50 inches of water, but in the spring the volume reaches 500 inches.

Near the mouth of the gulch the discoverers found a pit 100x150 feet, which is supposed to have been worked by a miner named Chris. Keyes, who, with a party which he had organized, was killed while on his return to his discovery in 1865. He was sole possessor of the knowledge of the whereabouts of the find, and his secret died with him. Search has since been repeatedly made for his old stamping ground, but until now without avail. The pit in question yields good prospects.

In the gulch were found two channels giving prospects as high as $3.50 to the pan. In the channels are five feet of solid gravel, averaging about a bit to the pan. The ground is not very deep, averaging from four to eight feet, and the locators are jubilant.

Benton is all excitement, and the demand for horse flesh is very great, for everybody, and all their relations, are either making preparations to go or send some one to represent them. —*Inter-Mountain.*

A PAINT MINE.—Mr. George Harmon recently sent in a box of red clayish rock from Willington's which we have had subjected to a preliminary test. It proves to be a formation of wonderfully uniform substance which makes, so far as tested, an extraordinary good body for Venetian red. It is very readily reducible to an impalpable powder, and there seems to be no residuum of gritty substance. Further experiments will be made. We are impressed that the only difficulty is that the deposit is too far away from the seaboard to permit of its introduction in the world's market. Venetain red can be purchased in Carson at about three cents per pound, while in San Francisco it is worth about one and a half cents per pound. The local market is not sufficient to warrant the construction of suitable works for grinding the substance into paint. Were freights at such a rate as to permit of easy transportation of the ore to the Bay, we have no doubt that George could make a handsome income out of his find. —*Eureka Sentinel.*

SETTLING NORTHERN CALIFORNIA.—A movement looking to the settlement of the northern counties of the State has been started and a meeting with that object in view will be held in Sacramento next Tuesday. Among others interested are N. D. Rideout, John Bidwell, W. H. Parks, L. Frear, J. Q. Brown, H. M. Larue, Judge C. C. Bush, General N. P. Chapman, Joseph Cohn, James Montgomery, F. C. Lusk, W. S. Green, J. B. Brown and Joseph Steffins, President of the Sacramento Board of Trade. The idea is to induce immigration into the northern counties and build that portion of the State up, as the southern portion was built.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

MECHANISM FOR BALANCING AND SUPPORTING MILLSTONE.—George Summerton, S. F. No. 303,761. Dated Aug. 19, 1884. This invention relates to certain improvements on millstone-irons; and it consists in a novel arrangement and construction of devices, applicable not only to millstones, properly so called, but to any apparatus operating similarly, or designed to supply their place. The patent covers details of construction.

SAFETY GUARDS FOR CARS.—Lewis Peterson, S. F., No. 302,024. Dated July 15, 1884. This safety guard for cars and other heavy moving objects, consists of a combination of devices. The principal object is to prevent such accidents to life and limb as are of frequent occurrence in cities, occasioned by persons being run over by street cars. The safety guard, patented, may be applied to cars and moving bodies of all kinds to prevent any object in front of the car from being run over or injured to any considerable extent.

COMBINED WHIP-SOCKET, OIL-CAN AND WRENCH. Cephas L. Bard, San Buenaventura, Ventura county. No. 304,062. Dated Aug. 26, 1884. This combination is intended for use with vehicles. It consists in a suitable whip-socket, to the lower end of which is secured an oil-can, both socket and can being secured to a wrench, and the whole fitted to the dash-board or other suitable portion of a vehicle. The object of the invention is to so combine the device above mentioned as to form a compact whole, readily adjustable to and detachable from each other and the vehicle about which each of the parts are to be used.

SAFETY CAR TRACK.—Jeanty Denechaud, Sr., S. F. No. 303,131. Dated, Aug. 5, 1884. The invention relates to that class of safety railway-cars in which rollers are projected into or withdrawn from its grooves in the rails by means of adjustable mechanism on the car, to prevent derailment on sharp covers and dangerous places. This patent covers improvements on a safety railway car previously patented by the same inventor. He provides arched arms which carry the rollers and has novel mechanism for operating them. The object is to shape the arms so that in their operation they shall not come in contact with cross-roads, and to provide more practical means for operating them.

WINDMILL.—Egbert B. Saunders and Geo. J. Bentley, San Jose. No. 304,136. Dated Aug. 26, 1884. This improvement in windmills consists of a tubular vertical post with a hollow channeled step in which it rests; a frame cast upon the upper part of the wrought tube, and having upon it the journal boxes of the wheel shaft; a cap for the tube, having a support for the upper arm of the vane and an anti-friction guide for the pump rod; a hollow pump-rod with an arm for direct connection with the crank-shaft by means of a pitman, without the intervention of a vibrating bar, and having a slab in one side to admit the regulating chain; a means for bolding the wheel in the wind, and a novel construction of the wind-wheel.

CULTIVATOR.—Morris M. Estee, Napa City. No. 304,811. Dated Sept. 9, 1884. The novelty in this cultivator lies in the arrangement of the tectb, the side series of which converge to the rear, and are carried by a suitable frame, whose sides likewise converge rearwardly. The attachment of the handles to the rear of the frame, the attachment of the pole to the front, and the arrangement of the crank axles of the wheels, in connection with the frame, are points of novelty included in the invention. The peculiar shape of the frame—namely a divergence of its sides to the front and the location of the pivot or steering wheel at the rear—enables the driver to turn the implement in a very narrow space and easily, while the crank axle by throwing the teeth clear of the ground prevents any accidents to them while turning. Having its wide part traveling foremost, the complete pulverizing of the earth is better insured, because the clods are gathered in and met by the teeth instead of being rolled away outward as with the ordinary cultivators. The divergence of the side series of the teeth to the front is advantageous in enabling the driver to run close to the rows in a vineyard or orchard with safety and accuracy—with safety because of the location of the teeth outside the plane of the wheels, and with accuracy because of the ready guide which the foremost teeth afford by enabling them to see at once how close he can go, determining his distance by said teeth without reference to the succeeding ones. The result cannot be effected when the frame is built in a reverse manner, as is usually the case, because the front teeth being in the longitudinal center of the frame, and consequently some distance from the rows, is an uncertain guide to determine where the most widely separated teeth will run. Having a pole the implement runs steadily and is easily managed, as the tiller enables it to be guided with very little effort.

MECHANICAL PROGRESS.

The Detached Steam Boiler Furnace Fallacy.

It is believed by many engineers that it is impossible to obtain complete combustion nf coal in a furnace surrounded by the heating surfaces of a steam boiler, as in an ordinary internally fired boiler, or oven in the furnace of the common externally fired horizontal tubular boiler where but one side of the furnace is exposed to the boiler surface, the reason advanced therefor being that tho temperature of any portion of a boiler-shell covered with water is so far below that due to the perfect combustion of the fuel that it exerts a chilling influence upon the fire, and prevents complete combustion. This we believe to be a grave error, and we think experience of parties who have tried detached furnaces, or those separated from the boiler and inclosed entirely in fire brick, and in which the combustion was completed before the gases were allowed to come in contact with the boiler-shell, will fully bear out the truth of our statement.

First, let us inquire if the combustion of coal in a well planned boiler furnace is so incomplete as is generally alleged by those engaged in the manufacture and sale of detached furnaces. We think not. The maximum evaporative power of a pound of good coal is in round numbers fifteen pounds of water from and at 212 degrees Fahr. It is no uncommon thing for an evaporation of twelve pounds of water under the above conditions to be obtained per pound nf combustible from a well planned marine boiler. This shows that 80 per cent of the theoretical evaporative power of the fuel has been utilized. If we make allowance for the heat lost by radiation and that passing off in tho escaping gases of combustion, we cannot avoid the conclusion that the combustion must have been practically perfect. Now no such result as the above has ever been approximated by any detached furnace arrangement. In no case that we are aware of has the arrangement given satisfaction. In two cases which have recently come under our personal notice, boilers were set in this manner, and the draught was produced by blowers. In the first case two boilers were provided, and it was always necessary to run them both to do the work. The tube head of one of them was soon ruined, fractured between the tubes, necessitating a new one. At the time the new one was put in, the owners were persuaded to reset their boilers in the ordinary way. After this was done, one boiler did the work very easily, and the consumption of fuel was very largely reduced.

In the other case referred to, a large compound tubular boiler was set in a similar manner. It was found to be utterly impossible to keep the tubes from leaking around their ends. (In both cases the heat passed through the tubes before returning under the shell.) After some persuasion the owners were induced to change tho setting to the ordinary type, when all trouble soon disappeared, and the consumption of fuel was reduced from 5,000 pounds per day to from 2,400 to 3,000 pounds per day. These facts speak for themselves, and we may legitimately inquire, what is the reason for this very great waste of heat in such furnaces? We have not far to look for the explanation. In our opinion it is simply this: The benefit of the radiant heat from the fuel is almost wholly lost.

According to the experiments of Peclet, the proportion of radiant heat from a bed of incandescent coal is one-half of the total heat of combustion. The practical conclusion to be drawn from this fact is that we should always so construct our boiler and arrange the furnace, whether the boiler be an internally or externally fired one, that the radiant heat shall be intercepted so far as possible by the heating surfaces of the boiler. This can be most perfectly accomplished by placing the boiler, as in the marine type. The next best, and one which is without doubt superior to all others for ordinary purposes, is the arrangement found in the ordinary horizontal tubular boiler. By keeping the furnace sides well away from the boiler nearly up to the water line, keeping the bridge wall well down and battering its face, making tho grate rather longer and narrower than is the usual practice, where a given amount of grate surface is wanted, we may fulfill the conditions requisite for economy in a most perfect manner, and a boiler so set will have an evaporative efficiency fully equal to the best internally fired one, so long as the setting is kept in good repair.

It may be argued that in the detached furnace the radiant heat is taken up by the hot gases, and by them brought into contact with the heating surfaces of the boiler, and equally good results obtained, but this is a fallacy. The radiant heat passes through the gases of combustion without warming them, exactly as the sun's rays pass through our atmosphere without warming it. The only way in which the radiant heat can be communicated to these gases is by being previously absorbed by the brick walls of the furnace; this is communicated to the hot gases as they flow over the furnace sides, but its intensity is very much reduced, and consequently the resulting temperature of the gases is much lower when they reach the heating surfaces of the boiler, and the evaporative efficiency is reduced in proportion. The more the principles of the action of heat are studied, the more clearly we shall see the necessity of burning our fuel in such a manner as to produce the highest possible temperature, and of so arranging our furnaces that the source of heat may be as close to the most effective steam generating surfaces of the boiler as it is possible to be and allow the gases chance to properly burn.—*The Locomotive.*

Iron Cars.

The *National Car Builder* says: "It is a common remark, even among railroad men, that iron cars will sooner or later come into general use, in view of the fact that timber is getting scarce and more expensive, and that the supply must ultimately run short. The inventors and advocates of iron cars must therefore bide their time. The committee on iron and steel in car construction, of the Car Builders' Association, in its report of last year intimated that all are of one mind on this subject, but that each is waiting for somebody else to take the lead, that it has taken many years to bring wooden cars to their present excellence, and it should not be expected that iron cars can be perfected all at once.

"One of the most recent devices of iron car construction is that of the Rohbins Cylindrical Car Company, which is something out of the ordinary way in which passenger cars have heretofore been built. The car is designed to supersede the ordinary wooden passenger car now in use. It is constructed of steel or iron and cylindrical in form, which renders it more durable, stronger and better adapted to the constant strain and concussion incident to railroad traffic than other cars. Above and beyond this, it is built with a view to lessen the liability to injury of passengers in case of accident, a need long felt, but not until now obtained. The form and material used are two great factors which enter into the construction of the car to obtain this result, but with them is added additional security to passengers from injury by fire, the furnaces being attached to the bottom of the car, the heat from the same being transmitted by radiation through pipes beneath the floor, and the floor itself. The interior—sides and top—are heavily upholstered and the floor carpeted, so that a fall occasioned by the car leaving the track and overturning will be attended with less serious results than now, with a chance in favor of a person coming out of the wreck unharmed." The car has other features, but we cannot make room for a longer description. It will be a curiosity, to say the least, but whether it will supersede the cars now in use is a question.

A New Barrel Machine.

The *Northwestern Lumberman* of Chicago describes a remarkable machine for the manufacture of tight barrel cooperage stock, now on exhibition in that city. It is the invention of Colonel A. C. Blount, of Pensacola, Fla., who had no practical knowledge of cooperage before he thought out his device. Rough pieces of board go into one end of the machine and come out at the other perfectly formed barrel staves, ready for the truss hoop. The invention is really three machines in combination—the first being for planing, the second for crozing and chamfering, and the third for jointing. The machine may be adjusted to any required size of stave, and then each stave is turned out precisely like the other. For example, in case 50-gallon barrels are to be made, the machine is set for 18 staves to the barrel, and each stave is marked 18 as it passes through, enabling the buyer of a package of staves to pick out 18 bearing that number and put them together in a barrel, regardless of the order in which they come. If other sized barrels are wanted, the machine is set for 17, 19 or any other number of staves which may be desirable, and the result is similar. The capacity of the machine at a medium speed is said to be 6,000 staves in ten hours, or, in case of 50-gallon barrels, 333 complete barrels each day. It is thought that this improved machinery will revolutionize the cooperage trade.

A REMARKABLE LOCOMOTIVE.—There has just been completed in a railway machine shop at Wilkesbarre, Pa., a locomotive which it is expected will be able to pull a train on the New York division of the Lehigh road at the rate of eighty miles an hour. The great speed claimed for this engine is attained by constructing the cylinders with the steam and exhaust entirely independent. This is done by using fewer plain slide valves (known as gridiron valves) on each cylinder. The valves are worked by a peculiar arrangement of valve gear, in which the motion is taken from the connecting rod, and working entirely on true centers, there being no sliding surfaces; the steam valve being independent of the exhaust, and vice versa, any point of cut-off or expansion can be obtained without the corresponding back pressure and over compression, as in the link motion.

THE MILLS OF OLD AND OF THE PRESENT.—In former times millers worked mainly with their hands, with just sufficient intervention of their heads to keep their hands out of harm's way. Now, however, it is the head that is mainly required, and while hand-work is still a necessity, brain work is the chief thing under the new conditions of the trade.

SCIENTIFIC PROGRESS.

Oxidizing Influence of Light.

Manufacturers of glass have striven to produce in this country a glass which for strength, purity nf color, and general luster would equal that made in France, England, and European countries; but thus far we have been unable to manufacture glass that would retain its color; after a time the best made would darken and show unmistakable traces of iron presence. For a long time it was thought that the sand used was so mixed with Ferric oxide that the color was directly traceable to this source, but after repeated trials with acids to remove the last trace of iron, and then cast into plates with the utmost care, the trouble was nearly as great; hence some other source, probably gas, must be the cause, for white glass all becomes more or less discolored after a time under the influence of gas. A building containing windows made exclusively of the best American plate was found to give the poorest light, after a time, in those portions where gas was used to the greatest extent, while in other portions where the jets were seldom used no change was manifest.

The more common colors noticed in glass is violet and green, the cause of which nearly all have advanced some theory, but after protracted study and experiment the following is given as the most plausible theory for the result:

The materials out of which glass is generally made in this country are to a very great extent ferruginous and susceptible of coloring the glass a deep green by means of this iron in the form of protoxide, a form generally met with when present; we have used the protoxide of manganese for the purpose of neutralizing its effects with variable success; the action of this mineral, it is superfluous to add, is to transform this protoxide into an oxide, the result being a yellowish red discoloration. Again this green color is partially annihilated by the complimentary violet which the oxide of manganese gives. It is the consequence of this coloring property that the name of pyrohcrite has been given to protoxide of manganese. It is scarcely likely, however, that the necessary respective of oxide of manganese and of oxide of iron are rigorously observed. If on the one hand, the manganese predominates, the glass has a violet shade; on the other hand, if a quantity of protoxide of iron is present the cast of the glass will be green.

Finally, if all the manganese is reduced to a state of protoxide, the glass is colorless, and the influence of light and air may determine at length a partial oxidation of the protoxide of manganese, and as a natural consequence, according to the rules of modern chemistry, a violet color will ensue and increase with the protracted action of light, especially that from gas jets.

Solar Explosions.

Faye rejects, as fabulous, the velocities of 100 or 150 leagues per second, which seem to be indicated, at the sun's surface, by the prodigious rapidity with which the protuberances are formed, and the partial displacements which are observed in the hydrogen lines. He suggests the great probability that hydrogen, when escaping rapidly into the rare medium which surrounds the photosphere, is at first chilled, on account of its enormous dilatation, and becomes invisible to the spectroscope. Afterwards, under the action of solar radiation, it is reheated in various places, so as to be seen by our instruments. An observer, who should return after a half hour's interval, to contemplate the phenomenon, would find the protuberances wonderfully enlarged, without the hydrogen having been required to transverse enormous spaces in the meanwhile.

Father Secchi saw small isolated clouds, forming and growing simultaneously without visible connection with the chromosphere, apparently in the same way as the clouds which are formed in our own atmosphere, from the vapor which already exists in the air, but which is latent and remains invisible, until a local cooling, or a change of pressure, determines its condensation.

Thollon contends, however, that the velocities which are indicated by each of these phenomena are qualities of the same order, and that their maximum value corresponds to the cometary velocities in the same region. Every movement of luminous matter, which approaches us or recedes from us, undoubtedly produces a displacement of spectral lines. No theory indicates, and no fact demonstrates, that any other cause it fitted for producing the same effect. It is, therefore, very natural to consider such displacement as an indication of movement.

Electrical Notes.

A new conductor of electricity just out is provided with a series of parallel grooves and protected hy an insulating sheath. It is based on the principle that the electric current passes along the surface of the wire and not through its substance, and that the insulating material operates to impede and diminish the force of the electrical current in its passage along the surface.

A French chemist has found that, under certain conditions, an observation of the electric resistance of water seems to supply a delicate test of its purity.

The inventor of an electric apparatus for deaf people claims that no ear is so dead that it cannot be made to hear, and that in many cases the apparatus will cure deafness. It may be concealed in a cane, umbrella handle, fan or any such article of convenience.

Portland, Oregon, will shortly be lit by electricity. The initiatory plant consists of three fifty-light United States dynamos driven independently by three Westinghouse automatic engines of 65 horse power each, which will also on occasion each drive an additional twenty-light dynamos.

The city of Brussels means to try the experiment of using electricity to drive its street cars in good earnest. One line—that on the Rue de la Loi—is to be equipped with motors, and separate accounts to be kept, in order to ascertain definitely the cost of the running, as compared with the use of horses. The test is to last one entire year, and then, should the result warrant it, electricity will be employed exclusively on the street railways of Brussels.

A New System of Telegraphy.

Signor Michela, an Italian, has devised a new system of telegraphing, known as the stenotelegraph, by which words may be transmitted with far greater rapidity than by the present system. The aim of Signor Michela is to telegraph by means of a key-board instrument any speech, no matter in what European language, at the same speed as it is delivered, or at the rate of 10,000 words in an hour. This apparatus has been in use in the Italian Senate, and an account of which has been written by M. Cassagnes. It works on the phonetic scale, and depends mainly for its success on the ability which the inventor has disclosed in grouping into series, and representing by combinations of signs all the phonetic sounds emitted in any language. As soon as the operator hears the words he divides them into sounds, and prints their graphic representations in short horizontal lines on a paper band. That is a stenographic record, but also at the same time the signs are being printed on the paper they may be telegraphed to a distant station.

The machine consists of two parts—the printing mechanism and that for the automatic forwarding for the paper. The latter is of no special character, but the printer consists of two key-boards having ten keys each; these keys press on twenty studs, which are by a system of levers connected to as many styles, which carry the signs or characters to be imprinted on the paper. It is stated that a skilled operator can take down with this apparatus 200 words per minute in any language he knows. For something like three years, it is reported, the system has stood the practical test, so far as stenography is concerned, and now the machine has been connected electrically with an apparatus for transmitting the signals to a distant station as fast as they are made, so that, if the receiver can translate the steno-telegraphic signals with rapidity, a speech might be read at the distant office as fast as the speaker himself delivers it. Without details of the mechanism, it is sufficient to explain that each key may be considered a true Morse key, and the board therefore represents a set of 20 Morse instruments, which, combined according to Michela's stenographic method, give a transmitting speed much higher than that of any existing telegraph.

THE VAPORS OF WATER AND NAPHTHA.—It is asserted that hy mixing the vapors of water and of naphtha at the temperature at which steam is produced the hydrogen in both is set free ready to be used in producing the most intensely hot flame known to science. How hot it is may be judged by the fact that while one pound of alcohol has a heat making power, say equal to 9, hydrogen has a heating power equal to 47—more than five times that of alcohol. While it is admitted that as much energy is required to separate the hydrogen and oxygen in steam as is produced by their combustion, it is claimed that a large part of this energy manifests itself in a different form from that heat—probably in the chemical process by which carbonic oxide is formed.

A NEW MICROTOME.—Prof. King has recently invented a microtome or an instrument for cutting vegetable or animal sections, but especially intended for vegetable histology. It gauges to one two-thousandth of an inch, and works with great precision and rapidity. The professor is now engaged in cutting the sections of the genus pinus, of which there are fifty-nine known species in North America, for the purpose of determining the species. This work is done for Prof. Sargent of Harvard College, who is the supervisor of Arnold Arboretum, Brookline, Mass. The sections are generally cut one one-thousandth of an inch thick, bleached, stained in two colors, and mounted, according to new methods of his own invention.

GAS FROM SAWDUST.—Deseronto, Canada, is lighted by gas made out of sawdust. It is claimed that the works show a product of 300,000 ft of gas out of 30 tons of sawdust at a cost of $106, with hy-products, of an aggregate value of $101, making the net cost of the gas 85, or 1.66 cents a thousand feet.

MINING AND SCIENTIFIC PRESS.

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☞ *See Advertising Columns.*

Passing Events.

There is very little news of special interest from the mining regions. The excitement concerning the Little Rocky mines, in Montana, is mainly local. There are so many miners in Montana and Idaho that they can soon cover a field without any accessions from California, Nevada or Arizonia, and being close by, have the best chance.

While local business affairs are somewhat dull some little impetus has been given to trade here, by reason of the Franco-Chinese war. Large shipments of provisions, canned goods, etc., are being made from this port to China. Among other things, the Chinese have bought in this city and shipped within the past month, upwards of 8,000,000 pounds of flour.

Prospecting in the mountains is nearly done for this season as in a short time the river will drive the wondering prospectors into winter quarters.

Mechanics' Fair Premiums.

The committee's report on class 2, hydraulic machinery and steam pumps, has not yet been received by the managers.

The Secretary, J. H. Culver, 31 Post street, desires that he be notified at once of any errors or omissions in names of persons or articles in this list, so that the premiums which are now ready may be suitably inscribed and delivered without delay.

THE Kentuck mine, in Patterson District, has struck a rich body of ore on the 500 level.

Dividend Paying Mines.

When people reap in the papers the figures in tables purporting to give the mining dividends for the month or the year, they naturally suppose that they represent all the mining dividends of the country. But this is a mistake. These tabulated statements only show the dividends from large incorporated companies, most of which advertise their notice of dividends. The newspapers have no means of finding out the profits of mines generally, any more than they have of finding out the profits of any manufacturing or mercantile enterprises of a private nature. As a general proposition, it may be said that mining people are reticent on such subjects, and conduct their operations much as private individuals conduct any other business.

When big companies, with numerous stockholders declare dividends, the fact becomes generally known in the camp where the mine is situated, and in the town where it has its offices and principal place of business. Dividends have an effect on the price of stock, and many big companies care more for this than they do about the dividend itself, as the officers and shareholders are, to say the least, apt to be as interested in the price of shares as in the mine itself.

Of the profits of thousands of small mines all over the country, or of large ones owned by individuals and not companies, the press and public know nothing whatever. The owners are not apt to be communicative on the subject. They are working these mines for the bullion they yield, and not for stock-jobbing purposes. Therefore, they consider that the public have no concern with their profits or losses.

Last year, for instance, the bullion product of the States and Territories west of the Missouri river aggregated $84,639,212. No estimate ever can be given as to how much of this sum was paid out in dividends. It was known how much the big mines paid but the amount was comparatively very small. It stands to reason, however, that among the thousands of mines being worked, whose product is embraced in the aggregate given, there must have been very many which were paying profits. But there is no means of knowing how many. There were very few of the incorporated companies in California which announced dividends last year, yet the State produced between sixteen and eighteen millions of dollars. Numbers of quartz, drift and hydraulic mines were paying their owners largely, yet the figures never found their way into the tables of dividends which were published.

In fact it is these small mines, worked by partnership, individual or private companies which make up the life of the mining region. For one big, well-known company, there are a hundred small ones. Their owners settle up the country and build up the mining camps, and increase the bullion product, but they make no noise about it, and do not care for any advertising of their mines. When a mine has been worked in this way for a long time, and is then made a stock company of, with a list of officers, shares for sale, etc., it is a pretty good indication to those best posted that the "meat" is out of the mine. Then there are mines worked in a private manner by such men as Hayward, Haggin & Tevis, Hearst and others which yield handsome fortunes every year, but nobody but the owners knows how much. It is just as well to bear these facts in mind when reading in the Eastern papers the lists of dividend paying mines. They do not represent the one hundredth part of the mines that are paying profits to their owners.

Tribute Mining.

Until within a few years the tribute system of working mines was scarcely known on this coast, and was practiced in very few places. Now a large number of mines are worked by tributers, and the system seems to be growing in favor. It is principally due to the presence of so many Cornish miners that this system, so long in vogue in Great Britain, has come to be grafted into our mining customs in this country. It is perhaps more widely carried on in Colorado than elsewhere on this continent, although in other States and Territories there are many tributers at work in the different camps. In another column is a short account of the wages earned at this sort of work in Nevada county, California.

Men work better when working for themselves than when paid by the day. In working other people's mines by tribute there is more encouragement than when digging away for day wages. There is a chance for the miners to make a good raise when they have a percentage of the profits, and they know that no matter how hard they work when day's wages are paid they will get no more. The tribute system is a good thing for the mining community in more ways than one.

Arizona Copper.

The copper mining industry in Arizona is rapidly increasing in importance. But, profitable on the whole as it has been, it has in a number of instances been disastrous. Poor management, lack of metallurgical skill, too much waste in providing reduction works before the mines were fully developed, and absence of proper amount of capital, have led to failure. Again, mines near railroads, where they could get fuel, can do better than those at a distance from it. But because a miner has a copper claim it does not always follow that he can make money out of it. Those well operated, however, and with good smelting plants, have mainly done well.

The ores of Arizona are almost exclusively carbonates and oxides, not carrying enough silver to make its extraction profitable, though in some instances ores richer in silver have been found. As yet in most of the mines they have not gone deep enough to open notable deposits of sulphurets, and until that point is reached no falling off in production need be looked for in the more favorably located mines. Some of the ores are very easily smelted and furnish excellent copper. It is not the rule, however, that oxidized ores must produce a pure metal. The general practice in Arizona is to smelt these ores in water-jacket furnaces, with coke as a fuel wherever available. The ores are usually basic in character, and require silicious fluxes. The tendency in the smelting business in Arizona appears to be in the direction of fast driving by using high pressure of blast and chambers for gathering flue dust, thus running up the capacity of the furnaces and diminishing general expenses and the labor account. The three principal centers of copper production in the Territory are in the Clifton District, in which the Arizona and Detroit companies work, Bisbee, where the Copper Queen has made such a success, and Globe, where the Old Dominion is the leading producer.

Joint-Protector and Igniter for Fuses.

Among patents recently issued by the Government, of interest to the mining community, is one to Eldridge A. Thompson, of Silver City, Idaho, obtained through the MINING AND SCIENTIFIC PRESS Patent Agency, for a protector for the joint of a fuse, in blasting. It may be used whether the joint be made by the union of two pieces of fuse or the union of the fuse with the caps; the protector being also applicable as an igniter of the fuse.

The protector and igniter consists of a piece of cloth prepared in a peculiar manner, with certain proportions of resin, mutton tallow and beeswax melted together. Into the melted mixture the cloth is dipped until it takes up sufficient to fill its pores and cover its surface with a thin layer of the material.

When the cloth dries it is yet forcible enough to be handled in winding and tying and is both water-proof and inflammable. It is of importance to render the joint between the cap and fuse water-proof. When the hole is tamped with water it is necessary to effect this result to prevent "missing the hole." In any case where dampness surrounds the fuse it is essential to protect the joint. By wrapping this prepared cloth around it, this is accomplished. By reason of its inflammable nature it can be used for igniting the fuse, a use to which it is adapted with better and cheaper results than the ordinary candle stuff. For an igniter a small piece of the prepared cloth is tied around the fuse near the end farthest from the cap. Miners often use soap, tar, grease or clay to protect the joint, but this is quite an improvement.

THERE is upward of 300 men working in and about the mines and mills of Tuscarora.

Anaconda, Montana.

This town takes its name from the Anaconda Mining Co., of Butte City. It is the seat of the concentrating and smelting works of that company. It is distant about twenty-seven miles from the mine, and ore must be brought here by cars on the line of the Utah & Northern Railroad, just over the branch line to Silver Bow Junction, then on the main line to Stewart, and then on another branch to this place. The natural query arises, why have the smelting works so far from the mine? There may be other considerations than are apparent to any visitor to Anaconda, but the following reasons are easily discerned: First, by selecting the present site the company were able to buy a large extent of land for their works, and for the town which is tributary to them, including a magnificent water right or power on the Warm Springs creek. This stream will furnish ample power for running whatever machinery the company may need, and it is a creek more free from ice in the winter season than any other in this section of the country. Already three turbine water-wheels are in place in the works, which will supply power equal to that of a 450 horse-power engine, and if more power is needed it can easily be obtained. The water is taken from the creek about a mile and a half above the wheels, and a fall of 70 feet is obtained. The lay of the ground is such at the works that concentrators, smelters and matte houses may be on separate terraces of the hillside, and by this arrangement the largest economy of labor is obtained, much of the work of handling the crushed ore being made automatic by the use of water. Cord wood for use in the furnaces is much cheaper here than at Butte. The saving in this item, added to the advantage of water power, will probably be as great as the cost of transporting the ore from the mine, so that the company has all its other advantages as clear gain. The town was founded, or laid out, one year ago last June. Since that time it has been a hive of industry. The company have kept from 400 to 500 men steadily employed, paying out in wages some $40,000 to $50,000 per month. Scores of small residences and stores have been erected, some of them of brick, and to-day the population of the place must be fully 1,000. There is a bank, managed by gentlemen more or less interested in the Anaconda Company, and all other institutions needed by any thriving burg of similar population. Hotels, boarding-houses and saloons are most numerous. The town is regularly laid out upon the level creek bottom, and presents one of the prettiest town sites we have seen anywhere. Lots sell for $100 upwards. The upper Deer Lodge valley, of which the Warm Springs canyon is a branch, is a good agricultural section. There are said to be good mining prospects in the mountains adjacent, so that the village has prospects of stimulants to its growth from various directions.

As to the mammoth works of the Anaconda Company here, it is too early to give a description of them. They will be in operation in a month or so, when it would be more opportune to speak of them in detail. But some idea of their extent may be inferred from the fact that the main furnace room is 498x150 feet in dimensions, and the concentrating building 220x200 feet. The matte building will be equally commodious for its requirements, and there are besides a machine shop, blacksmith shop, office, boarding-houses and other buildings. Another large furnace building is now being erected. Four hundred and fifty to five hundred men will be regularly employed at a probable average salary of $100 per month each. The main driving belt in the concentrating room will be a series of huge ropes, which will conduct the power from a wing of the main building to its very summit, over 200 feet. The masonry and frame work throughout are massive and solid, apparently equal to any possible emergencies. The probable aggregate cost of this magnificent plant—the largest of the kind in the world, we think—will be at least $1,000,000.

ASSISTANT UNITED STATES TREASURER SPAULDING'S reports a steady demand for dollars from the interior. The coin is sent free to all parts of the State, the expense of transmission being defrayed out of the silver profit fund arising from the difference between the coin value and the bullion of metal used in the manufacture.

Mechanics' Institute Medals.

Full list of Official Awards for Exhibits at Mechanics' Fair.

Gold Medals.

CLASS 1—Ohmen & Simmons automatic cut-off steam engine. CLASS 3—San Francisco Tool Company, best general display of iron working tools and machinery. 4—Pacific Saw Manufacturing Co., display of saws. 5—The Royal Mustard Mills, display of mustard machinery in operation. 11—Hawley Bros. Hardware Co., best general display of agricultural machinery. 12—California Iron and Steel Co., display of pig iron, charcoal, blooms, bar iron and steel. Judson Manufacturing Co., cast hardware files, nails and tacks. California Wire Works, display of wire rope. 15—Hall's Safe and Lock Co., best display of fire and burglar proof safes. 16—Will and Fink, display of cutlery. 17 San Francisco and Pacific Glass Works, display of California-made glass ware. 18—Emile Boesch, headlights, and car reflector lamps. Weed and Kingwell, best assortment of brass works. 19—John Mallon, display of glass for architectural work. S. & G. Gump, display of mirror and picture frames, mantels, engraving, bric-a-brac, etc. 20—T. M. Antisell & Co., display of California-made pianos and organs. Joseph Mayer, pipe organ, California make. 21—A. Folsom, best general display of carriages, California make. David Kerr, best two or four-horse truck. Charles W. Stein, best display of carriage material. 22—Indianapolis Chair Manufacturing Co., best general display of furniture. 25—Main & Winchester, general display of harness and saddlery. H. Liebes & Co., display of furs and their manufacture. 27—Carlson & Currier, California manufactured silk thread and silk. Pioneer Woolen Mills, display of home-manufactured woolen goods. 34—Arpad Haraszthy & Co., best general display of wines and brandies. 38—John Roach, best surveying instruments. California Electric Light Co., display of electric light. Thompson & Houston Electric Light and Power Co., display of electric light. 42—B. Natban & Co., general display of art work. 46—John H. Sievers, for excellence and fine display of flowers.

Silver Medals.

CLASS 1.—Joshua Hendy Machine Works, engine with slide-valve, vertical engine and boiler combined. George Bull & Co., portable engine on wheels. Hawley Brothers' Hardware Co., straw-burning engine. Thompson & Evans, upright yacht engine. H. P. Gregory & Co., gas engine. Risdon Iron & Locomotive Works, steam boiler, "Heine's patent." 4—P. McG. Chisholm, portable saw-mill. H. P. Gregory & Co., best general display of imported wood-working machinery, best surfacer and matching machine, best shingle machine.

CLASS 3—San Francisco Tool Company, best engine lathe; best power drilling machine. California Bellows Company, best hand bellows; best tuyere iron. W. T. Garratt, best fan blower, "Anderton patent." George Cumming & Co., best portable forge.

CLASS 5—W. A. Bell, display of models and machinery. S. F. Chronicle, best display of stereotype plates and matrices. Examiner Publishing Co., display of stereotype plates, matrices and paper. Gillet Ice Machine Co., portable ice machine. J. M. Thoms, Lamson cash railway. H. H. Bodwell, Excelsior Self-Regulating Windmill. Henry M. Taafe, automatic safety guard for railway cars.

CLASS 6—L. Rsdowitch, rock-breaker. E. A. Rix & Co., rock drill, air compressor. F. A. Hill, quartz mill. Goss & Dow, vertical mining pump. E. C. Denniston, amalgamating mining plates.

CLASS 8—E. Nunan, screw hose coupling.

CLASS 10—John H. Mooney, bag sewing machine, "Mooney's Patent." Cal. Silk Culture Development Co., silk reeling machine (in operation). Sam'l Hill Estate, best family sewing machine. Same, best exhibit of man'fg sewing machine. Same, best button-hole machine.

CLASS 11—Baker & Hamilton, display of agricultural implements. Hawley Bros. Hardware Co., reaper and mower with self-rake, thrasher and separator. H. W. Rice, potato digger, portable hay press. F. A. Hill, gang-plow (Cal. make). G. G. Wickson & Co., centrifugal cream separator. Ira Bishop, sack elevator. Baker & Hamilton, barley crusher. Henry Tyack, wine press.

CLASS 12—California Wire Works, wire goods. Burton & Hoyt, bolts, nuts and screws.

CLASS 13—Taylor Goodrich, best display of stoves and ranges. C. D. Harvey, hot water heating apparatus. United Gas Improvement Co., display of gas cooking and heating apparatus. Albrecht & Waters, cooking stove (Cal. make). J. D. Bodwell, (Perfection) liquid fuel.

CLASS 14 Osborne & Alexander, display of hardware and mechanics' tools. J. S. Bean, artificial flies. Liddle & Kaeding, display of fire-arms (Cal. make). E. T. Allen, very fine display fire-arms and fishing tackle.

CLASS 15—W. Wilshire & Co., best fire-proof safe, burglar proof safe. Hall's Safe and Lock Co., best burglar-proof lock. Perriam & Smith, best locks, California make.

CLASS 16—Will & Fink, best carving set. Pacific Saw Manufacturing Co., best planer and currier knives. Frank A. Davis, cutting dies.

CLASS 17—California Stone Paving Co., artificial stone pavement. W. W. Montague, display of mantles, marbleized iron mantles. Taylor Goodrich, art castings. S. P. Kimball & Co., California pozzulani cement. Granolithic Paving Co., artificial stone steps and paving. San Francisco and Pacific Glass Works, druggists' glassware. J. Browell, patent chimney flues, tops and lining.

CLASS 18—Weed & Kingwell, best display of bells, brass and composition castings. Grimm & Nolan, gas fixtures, California make. A. S. Graff & Co., coal oil lamp and diamond burners. J. T. Titus, best sewer trap. Fay & Co., treatment of redwood in imitation of other wood. S. & G. Gump, onyx pedestals. John Mallon, cut and embossed glass.

CLASS 20—Mr. O. H. Goodwin, key (musical) indicator. Kohler & Chase, best display of musical implements (imported), best brass wind instruments. Charles Morrell, banjos (Cal. make). Zeno Mauvais, best display of pianos and organs (imported).

CLASS 21—A. Folsom & Son, best coupe, best open rockaway. M. J. McCue, best hack, best top rockaway, best top buggy. W. E. Shaw, village cart, open buggy. Studebaker Bros. Manufacturing Co., best display imported carriages. Carville Manufacturing Co., best buggy-top phaeton. E. Soule, best dump-cart. J. A. Bilz, display of two-wheeled carts. Hawley Bros., best farm wagon (imported). Baker & Hamilton, best 4-seat spring wagon (Cal. make). David Kerr, ambulance for dumb animals.

CLASS 25—P. T. McNulty, best display of boots and shoes, Cal. manufacture. Main & Winchester, best set of carriage harness.

CLASS 26—California Jute Mill Co., display of jute and jute manufacture. The Examiner Publishing Co., display of printing paper.

CLASS 27—Pioneer Woolen Factory, display of all-wool cassimeres. California Silk Culture Development Co., specimens of California manufactured silks. J. Spaulding & Co., best process and compound for cleaning and renovating carpets.

CLASS 28—Joe Poeheim, best gents' dress and business suits. Wm. Sonderup, display of skin clothing. Chas. Sutter, Jr., oiled clothing.

CLASS 29—A. J. Balny, display of ostrich plumes, plain and colored. Miss Minnie James, best ladies' dress suits "style and finish." M. H. Ober & Co., corsets. Mrs. K. M. Stewart, bounets and bats.

CLASS 30—Quigley & Son, granulated smoking tobacco. The Friend Erskin Cigar Co., best cigars, California manufacture.

CLASS 31—Henry Lake, shoe blacking. Russian Cement Co., display of liquid glue. Western Perfumery Co., best display of perfumery, California manufacture, best flavoring extracts. Bothin Manufacturing Co., baking powder.

CLASS 32—Thomas Morton, display of coals. California Silk Culture Development Company, collection of cocoons and raw silk. Woodward's Gardens, collection of stuffed birds and mammal skins.

CLASS 33.—Wheeler Packing Co., display of fruits and vegetables in glass. Mrs. Sol. Runyon, jams, jellies and preserves (home made). George Haas, display of confectionery.

CLASS 34.—Arpad Haraszthy & Co., Eclipse champagne (Cal. make). G. M. Jarvis, excellent display of wines and brandies.

CLASS 35.—Burnell & Turner, Albion ale and porter.

CLASS 38—Sperry Electric Light Co., display of arc and incandescent electric light. California Electrical Works, best display of telegraphic and electrical apparatus. Electrical Supply Co., Brook's Faradic current distributor. Baxter Overland Telephone Co., best telephone and transmitter. John Roach, illuminated plumb bob. W. B. Wilshire & Co., best display of scales. Davis & Look, best incubator and breeder. United Gas Improvement Co., Siemens' patent regenerative gas lamp.

CLASS 39—Mrs. C. W. Stevens, adjustable shoulder brace and suspender. Wm. Beeman, artificial limbs.

CLASS 40—Thomas Hatch, display of California and Pacific woods. Miss Maggie Butte, point lace. Mrs. P. J. Kramer, display of embroidery.

CLASS 42—Mrs. Theresa Corlett, best display of Barbotine and Florentine pottery. Mrs. Helen Brode, best collection of ceramic art. T. R. Southern, display of penmanship and lettering.

CLASS 45.—Pacific Coast Amateur Photo. Association, display of instantaneous photographs. N. M. Klain, photographic landscapes, including buildings. New York Photograph Gallery, display of photographs. Mrs. C. E. Danielwitz, display of crayon portraits.

CLASS 47.—Sol. Runyon, best general display of fruit. Mrs. Charles B. Brigham, best floral design by an amateur, "pagoda and summer house." Misses Rose and Geraldine Coursen, best floral bouquet by amateurs.

Bronze Medals.

CLASS 1—H. W. Rice, steam engine governor. Garcelon & Moore, rotary steam engine. W. T. Garratt, boiler feed injector.

CLASS 3—C. F. Marwedel, best display of machinists' tools. San Francisco Tool Company, best shaper for metal work.

CLASS 4—H. P. Gregory & Co., band sawing machine, ripping and cross-cutting saw.

CLASS 5—H. W. Rice, lifting jack. F. O. Landgrave, change gate for street cars. Hawley Bros. Hardware Co., Perkin's patent wine mill. P. P. Mast & Co., Turbine wine mill. E. W. Tifft, decorative designs for business houses.

CLASS 6 Joshua Hendy & Co., ore feeder, hydraulic nozzle.

CLASS 7 E. W. Melvin, (New Becker) washing machine.

CLASS 9—G. T. Peters, model ship Excelsior.

CLASS 10—Dukerman & Austin, shoemakers' needle.

CLASS 11—Hawley Bros. Hardware Co., corn sheller. Baker & Hamilton, power churn, harrow (California manufacture), improved header. P. P. Mast & Co., riding cultivator, sulky hay rake. G. G. Wickson & Co., hay and straw cutter.

CLASS 12—C. Nutting & Son, iron wheel-barrow. E. A. Rix & Co., ornamental ironwork, feucings and castings. Cal. Iron and Steel Co., malleable iron castings. Clot & Meese, wrought iron rim pulleys. Lock Spring and Mattress Co., best mattress spring.

CLASS 13—Chas. Brown & Son, display of house-furnishing goods. J. F. Myers, (Monarch) oil and gas stoves. C. A. Cushing, gas stove and water heaters.

CLASS 14—Liddle & Kaeding, display of fishing tackle.

CLASS 17—W. W. Montague, fire-grates. San Francisco and Pacific Glass Works, self-sealing fruit jars.

CLASS 18—Weed & Kingwell, steam, water and gas fittings. Fred. Jantzen, coal-oil lamps.

CLASS 19—H. J. Esdor, display of sample goods of general manufacture. Boiler Furniture Manufacturing Co., square and octagon balusters. C. F. Schiller, plaster center-pieces and work. A. I. Sanborn, Newell posts.

CLASS 20 Robert Fay, general display of Cal. made pianos. G. F. Wells, orchestrones.

CLASS 21—Osborne & Alexander, best tricycle, best bicycle. R. Kelley, best huckboard.

CLASS 22—G. W. Clark & Co., display of wall paper, window shades and fixtures. H. H. Gross, folding bed. E. H. Marwedel, brass bedsteads, curtain poles and stair rods. T. S. Clark & Son, metal spring bed bottom. Keystone Wringer Co., spring beds. Fay & Co., wardrobe beds. John Callahan, drop roller for window shades. B. F. Farrar, spring mattresses. Truman S. Clark & Son, dressed goat skins.

CLASS 23—P. Liesenfeld, best billiard table cushions.

CLASS 24—Magazine Manufacturing Co., patent stove brush.

CLASS 25—P. F. McNulty, men's boots, hand made. Main & Winchester, best saddle, display of whips. P. F. McNulty, ladies' and misses' hand-made shoes. W. T. Y. Schenck, cotton hose.

CLASS 26—H. Liebes & Co., display of carriage robes.

CLASS 27—Pioneer Woolen Mills, display of flannels.

CLASS 28—J. H. Kruger, canes.

CLASS 29—Kelly Bros., corsets. Mrs. P. F. Butler, display of millinery. Kraker & Israel, display of machine-made embroidery. Davis Sewing Machine, best work done in fair.

CLASS 31—G. G. Wickson & Co., Imperial egg food. Continental Oil and Transportation Co., lubricating oils.

CLASS 32—C. Richard Knapp, vacuum press percolator.

CLASS 33—P. Wulff, mustard, sauce and pickles.

CLASS 36—W. S. Moore, display of amateur books and newspapers.

CLASS 38—Cal. Electrical Works, best telegraph printing apparatus. Cal. Electrical Works, best automatic fire-alarm apparatus, best hotel annunciator or burglar alarm. Electrical Supply Co., best telegraph set, key and sounder.

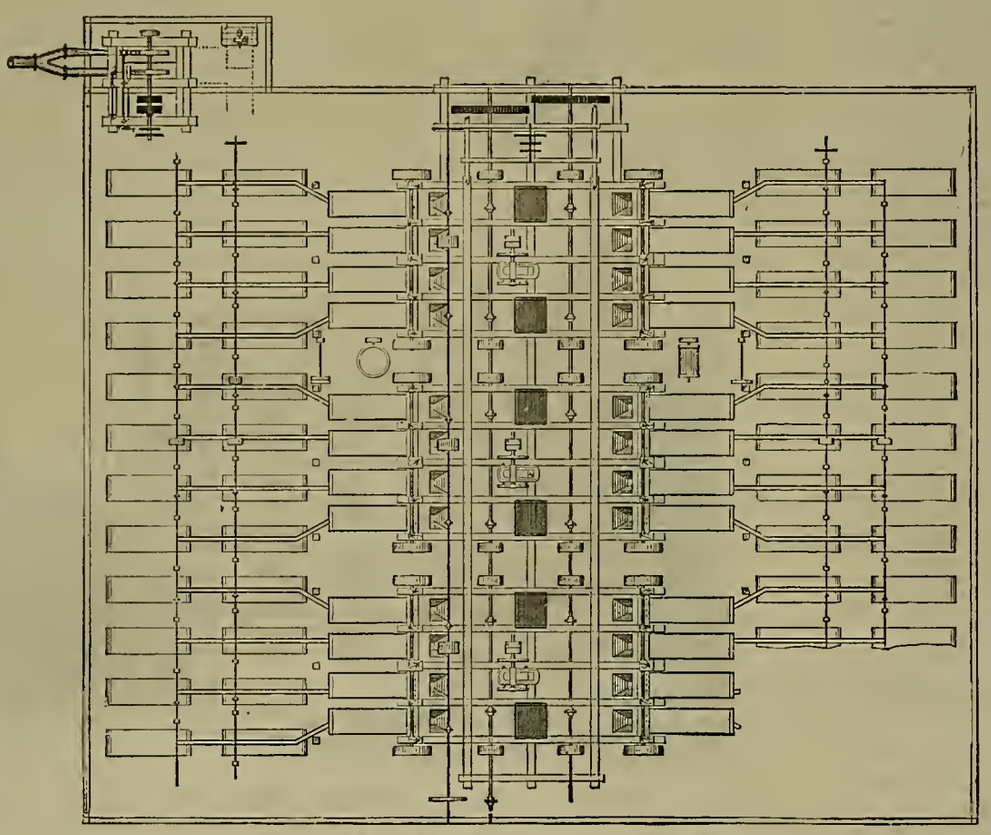
CLASS 39—B. Galland, folding cabinet bath.

CLASS 40—Mrs. A. Baker, wax flowers. Mrs. J. E. Cotter, preserved flowers. Miss A. M. Favor, needle work. C. Flammer, ornamental tables (shell). J. M. Litchfield, gold and silver embroidery. Chas. Peake & Co., Turkish rugs. Miss A. R. Vrooman, silk tapestry. Baumgartner & Bohls, Gold Bar cigarettes, California make.

CLASS 42—Mrs. F. A. Fish, best single specimen of painting on pottery. Mrs. Sarah H. Weston, gold enameled porcelain. Miss Carter, band-painted fire screen. Mrs. F. A. Fish, best collection of decorative art other than ceramic. Mrs. C. H. Morgan, painted panel screen in oil. Miss Eva McCormick, collection of luster paintings. Mrs. E. C. Hatch, water-color painting on satin. Mrs. Helen Brodt, best single specimen painting on porcelain.

CLASS 43—Miss Eve Josephi, Barbotine vases. E. L. Gifford, repousse work. Fred.

(*Concluded on page 204.*)



PLAN OF THE ALASKA 120-STAMP MILL. (See page 193.)

Oppressed Miners.

An associated press dispatch, dated Cleveland, Sept. 19th, says: The condition of the evicted miners and their families in the Hocking valley district is something to excite the commiseration of the benevolent. A mass meeting will he held in Columbus next week, at which W. P. Rend, a coal operator who has not redneed the price of mining, will preside, lor the purpose of eliciting both public opinion and public sympathy. In the mean time legal machinery is in operation down the valley, and evictions are heing constantly made. Every mau who refuses to abjure the union, to work for 50 ceuts a ton, to enter into au ironclad agreement to treat individually with the operators, to stipulate that he will never ask for an increase of wages in concert with another miner or miners, is turned out of his house, if he happens to he on the company's gronud, which is usually the case. His place is then giveu to a man who will work for 50 cents a ton under the contract of abridged personal rights.

As tbe terms proposed hy the operators are little better than absolute slavery, thousands of miners refuse to accept them. Want and destitution are becoming prevalent even before the winter begins. It is hard to conjecture what the couditiou will he three months hence. The tents sent by Governor Hoadly will uot shelter one-half the homeless people, and many of them are compelled to live in the woods like wild auimals. There are from 2,500 to 3,000 of these men in the mining district.

Almost the entire eommercial husiness of the mining district is carried on through company stores, which are stocked with everything sold in large towns. The miners are compelled to buy in these stores. They are given checks, which they present when they make a purchase, and these are charged up to them aud subtracted from their wages at the end of each month. The checks equal the wages of a man with family, and generally exceed hy 50 per cent the monthly earnings of a single man. "I could not stand it to clerk in these stores," said a gentleman who was formerly engaged in one as a clerk, "it was robbery of the most unprincipled sort. Every imposition was practiced on miners. The cash buyer could get a full plug of tobacco for 50 cents, and a miner with a check was required to pay $1. Coffee was sold to the cash buyer at 16 cents a pound, and to miners at 26 cents. Prints that went to the cash buyer at 6 ceuts a yard, cost the miner's wife and daughter double that amount. The miners were invariably charged from 35 to 50 per cent more for everything than were people who paid cash, and more than 80 per cent of the aggregate earnings of the miners was paid over the counters of the stores in goods and groceries at an average of almost two prices. When operators were giviug 70 cents a ton and paying for most of it in goods, the price of mining was redneed nearly one-half. I believe that the miners would work at 60 or 55 cents a ton if there were no compauy stores, so that they would be paid in cash and left to purchase at independent stores, where husiness competitiou wonld keep prices down."

Tribute System at the Empire Mine.

A correspondent of the *Bulletin*, writing from Grass Valley, Nevada county, says:

The second great mine of this district is that known as the Empire or Ophir Hill. It is located as the same side of the town as the Idabo, and is also about a mile and a half from the heart of the town. The Empire, perhaps, has heen worked for a longer period than the Idaho, hut its dividends have been irregular, and the mine has frequently heen shut down in the course of its history. It has also met with disaster in the burniug of several mills, one of which cost over $100,000, and was on a scale of elegance never excelled in a quartz mill. The present mill is a small, well-built structure, with the exterior appearance of a C. P. R. R. waiting-room. Inside it is a model of neatness and handy arrangemeut, and is amply supplied with the best machinery of modern make for saving the gold. As to the monthly product of the mine, the uumber of men employed, the assay value of the ore hoisted and crushed, the ratio of profit per tou, and similar interesting particulars, the visitor has no means of findiug out. This is a close corporation in every sense of the word. The men working for the company must keep tbeir mouths shut as to operations in the mine, or call at the office for notice of settlement aud discharge. Even the poor miners who cull the dumps for a percentage are not allowed to give au idea of their monthly return. What the public knows it gleans from stray bits of iuformation dropped here and there, which in some manner reveal the general uature of the property. From this sonrce it is premised that the Empire is just now in a most flourishing condition, aud outward indicatious would seem to point to the truth of this view, for the miuc employs a large number of men, pays them promptly, has money to put into new enterprises, while the managcment have the air of meu who know they have a good thing and intend to keep it.

Tbe Ophir is very largely worked by tbe tribute system; that is to say, a miner or group of miners takes a contract to get out a certain amount of rock for a percentage of the profit in it, or for so much per ton. In the Empire mine the following rate of tribute is the rule: On rock that pays $10 per ton, the miner gets 90 per cent of the profit; on $15 per ton, 85 per cent; on $25 per ton np to $40 per ton, 75 per cent and on any rock above $40 per ton, 60 per cent. To the novice these figures might seem to indicate that the tributer of the Empire is a fortunate individual. Such, however, does not seem to be the fact, as many a miner will tell you that tbe day worker counts his dollars in greater number at the end of the month than the man who works for a percentage. Nevertheless the charm of speculation is such tbat the Empire never wants for an ahundance of tributers.

The Empire is worked by steam only, and on every side of the buildings are huge piles of wood, hundreds of feet in length hy an average of fifty feet in width and fifteen or twenty feet in hight. This wood consists mostly of the common scrub pine of the surrounding mountains cut into four-foot lengths, some of it split, but much of it in a natural state. This wood is furnished the mine by adjacent farmers and woodmen, who are paid an average rate of $4.25 per cord delivered and piled at the mine. During the course of the year the Empire nses immense quantities of this wood, and it is safe to assert that it is one of the most expensive items iu the list of its expenditures.

AN IMMENSE DAM.—The Montana Improvement Company is now putting in on the Big Blackfoot, near its mouth the largest dam ever constructed in Montana. The river at that point is about 350 feet wide. The dam is heing constructed on a riffle, where the water does not now exceed three feet in depth, but it is eight or ten feet deep above and below that point. Au experienced builder from the East has charge of the work and has seventeen men employed. All the timber is on the ground, and the foreman says if he can get it in before the slush ice runs, as he expects to, he has no fears of its going out. The bottom stringers, immense timbers laid up and down the stream, are 100 feet long. The breast of the dam is ten feet high. Its estimated cost is approximately $20,000. The object of the dam is to make a pool a half mile or more long iu which to boom logs without making a slack-water. The entire enterprise will cost $150,000.

USE HAND-JIGS.—Claim-owners who have jiggiug ore, hut who cannot afford steam or water power jigs, should go up to the Idaho Democrat mine, up Croy gulch, and see the hand-jig in operation there. It makes from one to one and a half tons of first-class ore per day, at a cost uot exceeding $5. A hand-jig, it will be remembered, was first used hy the Jay Gould company as an experiment, and the result was so satisfactory that a dozen companies at once put in jigs.

LARGE consumers of ingot copper havej usj completed a pool for the purchase of about 5,000,000 pounds Lake Superior product, deliveries to run the balance of the year at the price of 13 cents per pound.

A Promising Mining Region.

The following from the Wood River *Times* gives some detail concerning Blackburn district Idaho: John Kendall, says that the region hetween Wood and Little Lost rivers—a stretch of country 120 miles long from east to west, and from the Blackfoot road on the south 300 or 400 miles to the British Possessions on the north—is practically unprospected and untrod by civilized man. Yet it is one of the most promising mining regions on the face of the globe.

Wherever a man goes he sees evidences of rich mineral, and any fair prospector may go there with a certainty of striking a good prospect.

Blackburn district—Mr. Kendall's home—lies iu this region. This district commences opposite D. B. Hawley's house, on Little Lost river, where a huge standstone reef 100 feet wide and 80 miles long crops out in a northernly and southernly direction. Over-lying this sandstone on the east is a ledge or stratum of black lime about the same thickness as the sandstone. Iu the contact between the two, at irregular intervals not more than a quarter of a mile apart, argentiferous galeua ores are found.

First, above Mr. Hawley's about six miles, is the Lizzie, an 18-inch vein of galena. The Silver Queen adjoins the Lizzie, and shows equally well. Half a mile above, on the Ingersoll, there is a vein of solid galena about two feet in width. A car-load of this ore recently sold in Salt Lake netted 118 ounces per tou. The Dixie comes next, but shows no galena.

The Combination is the next claim. The shaft is down 100 feet, and shows a good vein of carbonate of iron and galena, hut the width of the vein is unknown. The Carbonate Queen on the same vein, bas the same appearance. It has a shaft dowu 72 feet, all in ore.

The Tyndall lode was the first discovery. The ore of this mine is the freest galena ever seen. It goes 172 ounces per ton, from the grass roots, with 60 per cent lead. The adjoining claim shows no ore. Theu comes the Daisy Black, owned by three capitalists of Cincinnati, which shows a 9-foot vein of solid galena at a depth of 50 feet, the lowest of which goes 46 ounces, and the highest 1,776 ounces per ton. This from 13 assays, "promiscuous" samples. There are 1,500 tons of ore on the dump, and twice as much in sight. Four hundred feet north of the shaft is a 70-foot tunnel cutting across vein, which shows five feet of the same grade of ore.

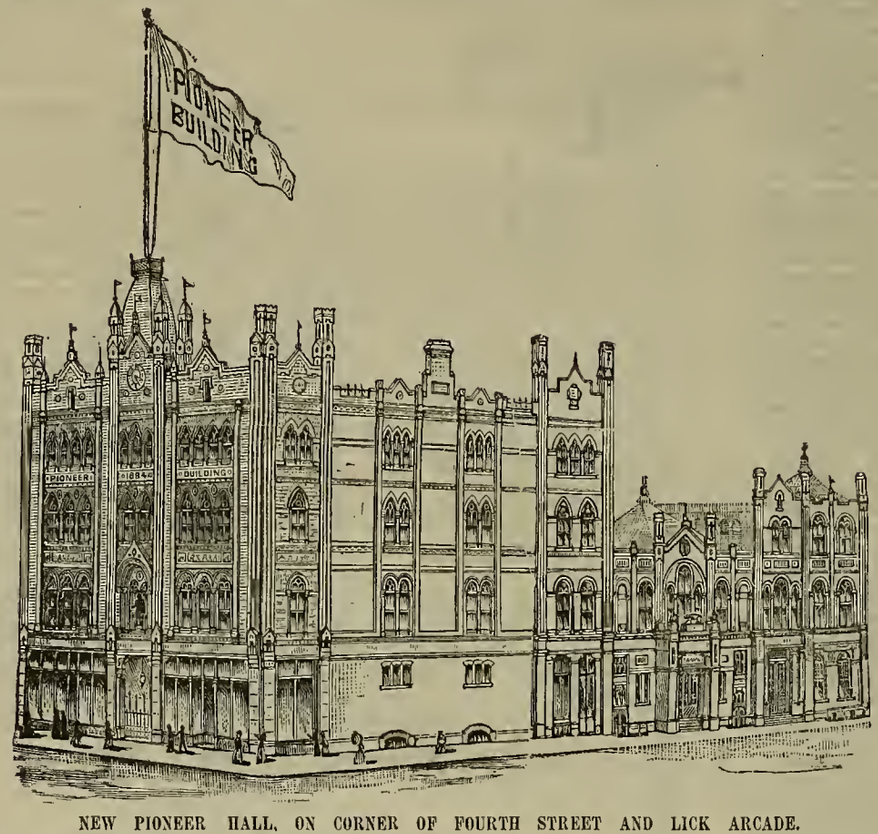
The Great Northern adjoins. It is also a magnificient claim, showiug a huge vein of sand carbonate ore, which is very rich. This belongs to the Daisy Black crowd.

Next comes the Alice, owned by Mr. Kendall. This has two tunnels and two shafts. One tunnel is in 128 feet, the other 60 feet. The long tunnel shows an average of 3½ feet of galena all the way. The ore assays from 200 ounces to 383 onnces. This was the showing of 12 assays. The 60-foot tunnel shows a width of *thirty-one feet* of solid carbonate ore, and the ore vein is not yet cut through. Mr. Keudall, the owner, prefers not to say how rich the ore is. There are five other promising claims in this camp, but there is not much work done on tbem.

The New Pioneer Hall.

Scattered throughout the mining regions of this State are hundreds of California pioneers who will he glad to learn that the Society of California Pioneers, which has its headquarters in San Francisco, is now erecting a handsome edifice. Through the munificence of James Lick the society has a valuable lot on Fourth street, near Market, upon which the building is beiug put up. For years they have occupied an old building on Montgomery street, but in a few months the society will have headquarters they will be proud of. The accompanyiug engraving, for the use of which we are indebted to the *Chronicle*, shows the appearance of the structure. The coruer stone was laid with appropriate ceremonies on the anniversary of the admission of California into the Union.

The new hall will be one of the handsomest and most substantial buildings in the city, and will cost $150,000 exclusive of furnishing. It will be located on the west side of Fourth street, and will have a frontage of 80 feet on Fourth by 195 on Lick arcade, with a depth of 275 feet. The architecture will he Venetian-Gothic with some modifications. The building will he four stories high, surmounted by a tower 102 feet high. The basement will be 14 feet high, 28 wide and 76 deep, and be used as a hanqueting room. The ground floor will he for stores. Above this will he halls large and small, rooms for the officers, library, two museums, billiard rooms, card rooms, a large hall for meeting purposes, 39 feet high, with a floor space of 64x48 feet and a gallery; there will be a barber shop, kitchen, serving room, etc., in the basement. Sandstone, iron, pressed brick and red terra cotta will be used on the outside of the building, which will, in the main be constructed of brick and iron. The Fourth-street front will be quite ornamental.



NEW PIONEER HALL, ON CORNER OF FOURTH STREET AND LICK ARCADE.

In this connection, a few words concerning the old Montgomery street headquarters will be interesting. On the 8th of July, 1862, the coruer-stone of the building now occupied by the Pioneers was laid by the Grand Lodge, F. aud A. M., there being a large civic aud military turnout. The orator of the day was William B. Farwell, who, by a happy coincidence, was orator of the day on the recent occasion. The lot was donated by James Lick, who also gave them the lot they are now building upon. When completed the old building cost over $24,000.

THE new cable for the Market street road has been hauled from Harrison street wharf to the company's engine house. It weighed 33 tons, and a team of 28 horses was required to effect the transfer. The new rope will not be laid for some time yet, the old one still being in good condition.

Gold Mining.

It has been stated that the Homestake is one of the most successful gold mining companies in the world, and the regularity with which dividends are declared and paid on its stock is the best possible assurance of the fact that the Homestake property is a great producer of gold bullion. Crops may or may not fail, times throughout the country may be good or bad, but the Homestake never fails to come to time with its monthly dividend. All this time there is a large force at work driving new tunnels, sinking new shafts and doing other work to facilitate the extraction of ore in the future, and this force as well as the hundreds of men employed in handling the ore now being milled, hundreds employed in cutting and delivering fuel and timber, all the men employed in and about the mills, are paid regularly each month, and still the dividends are regularly declared and paid, and there is a reserve fund constantly kept on hand to meet any emergency calling for extra dead work. As we have stated, the Homestake group is only one of many found in the Hills, and the success which its management has attained by judicious work points to the fact that other large properties further south, may, by being worked on the same principle, handling ores in large quantities and using large mills, be made to pay. The ore of numerous large veins throughout the southern part of Lawrence, through Pennington and well into Custer county is known to contain good metal in quantities to pay, and in many cases the natural facilities for working them are better than were those of the Homestake. One great advantage possessed by the Central Hills is an ample supply of water. This the Homestake did not have, and it was only at great expense that it was secured by ditching and fluming long distances, and combining many of the small streams of the Northern Hills. The great ore bodies of the Central Hills lie contiguous to good streams, such as Elk creek, the three Box Elders, Jim creek, Rapid and Castle creeks, Slate creek, Spring creek, and numerous tributaries—water enough to supply thousands of stamps. That the water will be utilized for this purpose is certain. The rights under which it is held will in the course of a short time become very valuable. —*Black Hill World.*

GOLD MINES OF THE TIBER.—An interesting statement was made at the last session of the Geographical Society. Mr. Del Mar, who has recently returned from Italy, stated that he had examined the ancient gold mines of the Tiber, which had been first worked by the Etruscans and afterwards by the Romans. The working of these mines by slave labor under the Romans led to the rebellion of Spartacus and to the interdiction of all mining by the Roman Senate. The mines were mentioned by Aldrovandus in the sixteenth century and Torricelli in the seventeenth, but since that time have passed out of notice. Their working by the Romans led to the fouling of the River Tiber, the formation of the pontine marshes and the conversion of the island of Cercaii into a promontory; their abandoument to the formation of the Tuscan Maremma, a fever-infested district which has only recently been drained. The lecturer traced the discovery and working of the gold mines of the Tiber, the Roman conquest and reopening of these mines and the numerous physical and social changes to which these events gave rise. From this it appears that the debris question, so new and important to California, had agitated the Roman mind twenty centuries ago and had been brought to a conclusion in one part of Italy by an amicable arrangement between the miners and farmers and in another part by an interdict of the Senate. The mines of the Tiber were placer diggings, some of which were situated near Perugia and others in the Veldi Chiana. At present they are entirely abandoned, the only gold mines at work in Italy being the quartz mines of Piedmont.

THE WEALTH OF HUMBOLDT COUNTY.—According to the Assessor's report to the Surveyor-General, the number of acres of land inclosed in Humboldt county is 42,300, of which 9,218 are cultivated. There are 4,000 acres of wheat, 5,000 of barley, 155 of oats, 2 of corn, 58 of potatoes and 17,700 of hay. There are 5,000 apple trees, 2,500 peach trees and a less number of pear, plum, cherry, nectarine, quince, prune and apricot trees. In the way of live-stock there are 5,600 horses, 200 mules, 10 asses, 32,500 cows and calves, 11,348 beef cattle, 66 work oxen, 57,600 sheep and lambs and 20 Angora goats. There are 3 grist mills and 10 quartz mills. There are 10 miles of mining ditches and 400 miles of irrigating ditches. The estimated population and the number of acres of land under cultivation are the same as in 1883, though there has doubtless been an increase in both within the last year. The assessed value of real estate is $2,100,935 and of personal property $1,042, 754.

THE San Francisco Copper Mining Company, of Spenceville, made an exhibit at the Grass Valley fair of native copper ore, raw copper ore, roasted, copper precipitates, sulphate of copper from leaching and sulphur. The Fox copper mine of Rough and Ready township exhibited specimens of 63 per cent copper ore, yielding $18 in gold and $16 in silver per ton.

USEFUL INFORMATION.

Adulteration in Leather.

An extensive adulteration of leather has just been detected and exposed by the inspectors of the imperial Government in Germany. It is accomplished by adding glucose in large qautities, by soaking the tanned hides in that adulterant, and drying them, which materially increases their weight, apparent solidity of texture and money valuation. The adulteration may be detected by macerating the leather in water for 24 hours or more, when a thick, ropy, viscid solution of glucose is formed. Not only is the weight of leather augmented by the process, but poor and sleazy products of the vat are turned out with the apparent density and elasticity of the finest qualities, and retain this appearance until saturation exposes the fraud.

This process of leather adulteration has also reached this country, and, according to a circular recently issued by the *American Tanner*, the city of Louisville, Ky. appears to be the American headquarters of this fraudulent practice.

When we are told, says that paper, that some samples of leather have been found which had as much as 30 to 40 per cent of extra weight, it seems that something should be done in this matter. There are numerous tests for glucose, but the most of them require a number of more or less expensive apparatus, while the following recommends itself by its simplicity and cheapness, as the complete outfit, consisting of s small test tube and two small bottles, one containing cupric sulphate and the other caustic potash, may be obtained anywhere, and can he carried with ease in a vest pocket.

A little scrap of the suspected leather is soaked in pure water; to this liquid, enough to fill about one-quarter of the test tube, we add a few drops of a solution of cupric sulphate, and half as much of a caustic potash solution as the liquid contained in the test tube; shake well and boil over a flame. If glucose is present, a yellow or red precipitate is formed in the tube.

Cupric sulphate, or blue vitriol, readily dissolves in water, and enough of it must be added to the sample to produce a faint blue coloring. The caustic potash solution is made by dissolving 58 grammes of the potash in 1 liter of water.

The principle upon which the test is based is as follows: The boiling alkali converts the glucose into glucic and melassic acids, substances which oxidize rapidly. The cupric sulphate is then converted into cuprous sulphate, and this again is decomposed, forming a deposit of cuprous oxide. Of course it is only a rough test, because we are told that under normal conditions leather contains a trace of glucose; but if the test has been performed once or twice on good leather, any excess of glucose in other samples can easily be detected by the deeper color of the more copious deposit in the test tube.

Glucose is a fraud, however used. It is even a greater fraud when used on leather than when used in adulterating sirup or sugar.

CELLULOID—ITS DISCOVERY.—A new material in the arts and manufactures made its first appearance in the United States about the year 1869. It was the result of a series of chemical experiments by men who were not chemists, but experimenters, seeking a substitute for ivory. It is more than likely that its final discovery was accidental, like the discovery of the mode of vulcanizing india rubber, and like the discovery of many of the great inventions. It took five years of experiments after its discovery to make it a marketable commodity. In the ten years since that time it has taken rank with the leading compounds of commerce and manufacture, such as india rubber, glass, steel, and paper. In its peculiar and varied utility it is superior to india rubber, and new modes of use are being found for it almost daily. It is as hard as emery, as delicate as tortoise-shell, as flexible as india rubber, as durable as iron, and as elastic as ivory. It resists acids and alkalies, and is unaffected by atmospheric changes. It can be molded, or carved, or turned into any desired form, and its natural state being colorless, it can be colored to any desirable shade. The name of this modern Proteus is celluloid. Celluloid is produced by dissolving gun-cotton in camphor with the aid of heat and pressure.

PAPER DOORS.—"Feel the weight of that door," said a builder to a reporter, who was looking at an unfinished apartment house up town. The reporter prepared to lift what seemed a polished mahogany door, but it proved too light for any wood. "It is made of paper," said the builder, "and, while it costs about the same as wood, is much better, because there is no shrinking, swelling, cracking or warping. It is composed of two thick paper boards, stamped and molded into panels and glued together with glue and potash, and then rolled through heavy rollers. It is first covered with a water-proof coating and then with a fire-proof coating, and is painted and varnished, and hung in the ordinary way. Few persons can detect that they are not made of wood, particularly when used as sliding doers."

BLUE GLASS AGAIN.—Only a few years ago the declaration that blue glass inserted in the windows of houses was a preventive of disease, and an invigorating agent, became a topic of almost universal conversation. The subject grew in importance as time progressed. Numerous dwellings discarded the old and present styles of white panes to a certain extent to adopt the blue, and to this day an occasional window may be seen where the blue-glass maintains its popularity. As a matter of public interest, however, after the blue-glass excitement had run its course, the subject was forgotten. It was General Pleasanton who first introduced it, but he has remained a long time silent. Suddenly he emerges from his privacy to express a renewal of his belief in the virtues of blue-glass. He says he intends to prove by ocular demonstration at the Pennsylvania State fair, that 3 year-old colts reared under it are as big as ordinary colts at five, and that all sorts of animals become larger and more prolific. When this has been done the faith of the public in the many excellencies of blue glass will be revived, but hardly before.

A NEW SYSTEM OF EMBALMING.—According to a contemporary, a remarkable discovery of a new system of embalming has lately been made which, if true, will thoroughly revolutionize this business. It consists of a rapid process of petrifaction or marbleizing of the flesh, veins and tissues. After the blood has been drained from the system the veins of the body submitted to treatment are charged with a mineral which not only, by its chemical action, changes the veins into hard stone, but before becoming entirely ossified has the same effect upon all the surrounding tissues. The idea was first discovered in Genoa by a chemist, who has already, by this method, marbleized a number of animals and placed them on his lawn. The chemicals are not very costly, and it requires only two or three weeks for them to have their proper action. The idea of being able to actually metamorphose the human body into stone, and placing it in one's garden or utilizing it for art purposes, may sound somewhat startling, but it is claimed to be based upon a sound philosophical principle.

SMALL INVENTIONS.—There is a fortune in so small a thing as a device for fastening a necktie. One of the patents in that line has just been sold to a company for $1,000,000 in cash and royalties that may amount to as much more.

HAY WATER is a great sweetener of tin, wooden, and iron ware. In Irish dairies everything used for milk is scalded with hay water. Boil a handful of sweet hay in water and put in the vessel when hot.

THE COMING PRESS.—Hoe, the inventor of the printing press which bears his name, anticipates, in the near future, the invention of a photographic press that will turn off 960,000 papers an hour.

GOOD HEALTH.

Boils.

A boil originates in the death of a small portion of the skin, which generally involves a sweat, or sebaceous, gland. Inflammation is the natural process by which the portion of dead tissue is separated from the living. The boil first appears as a red and somewhat painful nodule of skin, about the size of a bean or pea. Very soon a white point forms at the apex; swelling spreads about the center, usually attaining about the size of a dollar. At the end of four or five days, the central portion, marked by a white point, becomes loosened, and a discharge occurs consisting of a plug or core, together with matter, blood, and fragments of dead tissue. The suppuration generally ceases in three or four days.

Treatment.—Boils may often be cut short if treated early by a continuous application of ice. Dr. Eade, of London, claims to have discovered that boils and carbuncles are parasitic diseases, and that the proper treatment is very strong carbolic acid injected into the center of the boil by means of the hypodermic syringe. The best plan to be recommended for general employment is the early application of hot fomentations, by which the pain may be relieved, and the natural process hastened. When there is a great deal of general irritability, warm full baths are very advantageous.

If the boil does not open promptly, it should be freely lanced, after suppuration has taken place, as shown by softening. Warm poultices should be continued after lancing. Blind boils should be lanced and poulticed. The practice of squeezing boils is a very injurious one, as the matter is thereby dispersed into the surrounding tissues, often producing a numerous crop of boils in the vicinity of the first one. The discharge of matter should be secured by a large opening and gentle pressure.—*Good Health.*

Length of Our Lives Increasing.

At a recent international health exhibition held in London, Sir James Paget delivered an address before the association, the Prince of Wales being present.

The learned physician asserted that people live longer than formerly, and that less sickness prevails among the mass of people, and he then gives the following reasons for the decrease of mortality during the last few years:

"There is less from intemperance, less from immorality; we have better, cheaper and more various food; far more and cheaper clothing; far more and healthier recreations. We have on the whole better houses and better drains, better water and air, and better ways of using them. The care and skill with which the sick are treated in hospitals, infirmaries, and even in private houses are far greater than what they were; the improvement and extension of nursing are more than can be described; the care which the rich bestow on the poor, whom they visit in their own homes, is every day saving health and life; and even more effectual than any of these is the work done by the medical officers of health, and all the sanitary authorities now active and influential in every part of the kingdom. But we want," adds the lecturer in closing, "more ambition for health—a personal ambition for renown in health as keen as is that for bravery or for beauty, or for success in our athletic games and field sports."—*Scientific American.*

PAINS FROM AN AMPUTATED LEG.—The Dayton, O., *Democrat* of recent date says: A few nights ago a young man by the name of Clark lost his leg in a railroad accident. Since the amputation he has suffered acute pain at the knee, and declared that his leg was being twisted and cramped in the box in which it was buried. To satisfy his son, and determine whether the position of the limb in the box corresponded with the peculiarity of pain, or whether it was a simple hallucination resulting from excited and deranged nerves, Mr. Henry Clark, the father, went to the cemetery yesterday to disinter and examine the leg. As the men at the cemetery reached the box and commenced to work it up out of the ground, the sufferer turned to his friends and told them what was being done at the grave. He felt the jar of the box and the pain it caused. Out of curiosity, accurate time was kept at the bedside of the sufferer and at the cemetery, and the changes described by the young man corresponded almost to a second with those reported at the cemetery. The limb was found in the cramped position described, and he told his mother and attendants of the suffering he experienced while straightening out, and the relief experienced. When it was accomplished he dropped into a refreshing sleep. It is a curious and interesting case, and the full statement of facts should be secured.

TO REMOVE FRECKLES.—*Good Health* says: There are two kinds of freckles. Those which are produced by exposure to sun and wind are very superficial, and are easily removed by such substances as will remove the superficial cellular layers of the skin. Among the best remedies for this purpose are the following: 1.—Three tablespoonfuls of fresh-scraped horse-raddish; buttermilk, a pint. Allow to soak six or eight hours, shaking occasionally. Cider vinegar is sometimes used in place of the horse-raddish. Apply to the face at night, leaving on till morning. 2.—Two tablespoonfuls of lemon juice; an equal quantity of water; a tablespoonful of glycerine; a heaping teaspoonful of powdered borax. Apply three or four times a day, drying after fifteen or twenty minutes with a fluffy towel.

THE SOURCE OF BILE ACIDS.—According to Dr. Jensen, Pettenkofer's test for bile also holds good for peptones. It had long been surmised that the slight bitterness of the true peptones is due to the presence of bile in one of its initial stages, as manufactured by the process of digestion. Experiments have been made on boiled albumen, flesh, and a solution of gelatine, after being converted into peptones in separate bottles by a minute proportion of Dr. Jensen's pepsin. The albumen peptone gave a much stronger reaction with the bile test than did the peptone from flesh, and the gelatine peptone was almost unaltered by the test. It is thus thought that the albumen of food furnishes the chief elements for the bile. And the natural inference of a layman would be—too much bile, too much albumen.

KILLED BY GAZING AT THE SUN.—A lad 15 years of age, named John Gee, an inmate of an industrial school at Macclesfield, England, came to his death on the 13th ult., in consequence of gazing at the sun. He and another boy had tried which of them could stare longest at the blazing orb, and Gee soon complained of intense pain in his eyes and head. Toward night the pain became agonizing, and the boy died. A large number of deaths from sunstroke have been reported in recent English newspapers.

DEATH FROM PEANUTS.—A rather remarkable manner of death is reported from Lyons, N. Y. Stephen Whitlock ate enormous quantities of peanuts one day, washing them down with copious draughts of ice-water. The next day he repeated the operation, adding a lot of cherries to his bill of fare. In the evening he was seized with intense pains in the stomach, and continued to suffer great agony until death supervened. It was found that his stomach had burst.

MORTALITY AMONG CHILDREN.—At the recent Health Exhibition in London, Mrs. Ada Ballin delivered a lecture on the care of children. She said 18,000 children died in a single year from being improperly clothed, and depreciated the practice of shaking the little ones to stop their crying, which often caused serious injury. The lady also protested against rocking children in cradles, which she said tends to addle their brains and make them idiots.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

RUNNING.—Amador *Ledger*, Sept. 20: The South Spring Hill mill is again running full blast, with every prospect of continuing. Grading for the car-track is finished, and the steel rails are expected daily. Twenty stamps of the Lincoln mill are kept steadily at work. The ore is of low grade, but sufficient to pay expenses. Operations at the Mahoney have come to a standstill, except keeping out the water. It is understood that nothing more will be attempted until the injunction suit concerning the water is decided.

VOLCANO.—Amador *Sentinel*, Sept. 18: Our placer mines are now fixing up for the winter's run. Gillick is working his quartz claim and is taking out very rich rock. I think Terry has a real bonanza. I will show a specimen when I visit Jackson. The Grass Valley mine has paid very well this season; it will take about three weeks to finish the clean-up. Pioneer items: Griesbach has struck another very rich pay chute; also Henry Toop. Bowman and Denson are now in good pay ore, and the same with Johnny Klaman.

El Dorado.

RICH.—Mountain *Democrat*, Sept. 20: While in town the past week, Jerre Kendall told us that his gravel mine, near Grizzly Flat, was panning out much better than he had hoped for.

Inyo.

POLITA.—Inyo *Independent*, Sept. 20: At the Polita mine five men are now at work prospecting. Of late the indications are very favorable.

CASEY.—This mine is in the same locality with the Polita. Nine men are at work prospecting, and results of late have been so satisfactory that it is expected a mill will be built before long.

GOLDEN REEF.—During the past week Mr. Nixon has made valuable developments in Freeborn canyon. In two tunnels at different elevations a rich vein of ore was struck, the lower tunnel at a depth of 160 ft. The vein is wider in the lower tunnel than in the upper and the ore is high grade in both.

Mono.

STANDARD CON.—Bodie *Free Press*, Sept. 22: They extracted and shipped to the mill 490 tons of ore and 680 tons of tailings. Received from the ore 623 ounces of crude bullion, and from the tailings 390 ounces, which will be shipped with the present week's run.

CON. PACIFIC.—Pacific ledge No. 1 has been run 7 ft during the past week, making the total distance from the chute 67 ft. The ground is still very hard and working badly. The ledge, however, is looking more promising than usual. Some small feeders are coming in that gives ore of the value of $30. They think the prospect good for them to increase in size and quantity. Pacific ledge No. 2 has been advanced 7 ft; total distance 60 ft. Everything about the mine running as usual.

MONO.—Have cut out for and sunk the winze 6 ft below the 600 level of the Mono shaft during the past week. The ore from the winze is of low-grade—assays from 60 to 70 per cent in silver and 30 to 40 per cent in gold.

BODIE CON.—At the mill 190 tons of tailings were worked, average assay value of which is $6.50 per ton. At the mine the west cross-cut, 200 level, is in 50 ft; west cross-cut, 300 level, is in 20 ft; north drift from upraise above 400 level is in 55 ft; east cross-cut, second incline level, is in 50 ft; upraise, 500 level, is in 143 ft; upraise on Vulcan vein, 200 level, is up 20 ft.

BULWER CON.—Upraise from South drift, No. 3, 385-ft level, is up 56 ft. Progress during the week, 12 ft. The vein continues about 18 inches wide.

NEW STANDARD.—The New Standard Mine Co. is working 30 men at the mine and eight men at the mill.

Nevada.

RICH GRAVEL.—*Tidings*, Sept. 22: In digging a pit to put in a new water-wheel at the Larimer quartz mill, which mill is on Wolf creek, a mile or more below town, the workmen struck into a bed of gravel that had never before been disturbed by the pick or the shovel of the miner. Mr. Cornelius Sullivan, one of our oldest miners, was directing the work of making the place for the new water-wheel, and when the new bed of gravel was struck and some of the dirt turned, he remarked, "there is gold in that." He procured a pan and tried the gravel. The first panful of gravel yielded a half ounce of gold, the most of it being coarse of grain, but none of it being a nugget. The panning continued with the result of from $1 to $5 to the panful of gold. All passers-by were called to look at the diggings that really belonged to the "spring of '50," for Wolf creek was not a '49 creek of any great repute. There is about half an acre of this virgin creek gravel, and of course it will be worked out. It will probably be put through the Larimer mill along with the dirt under the old batteries of that mill. The whole bed of Wolf creek has been turned over time and again by the gravel miners, and how this half acre escaped undisturbed to this day is somewhat curious. This bit of mining ground will not last any great while, but it is very rich.

WASHINGTON TOWNSHIP MINES.—The township of Washington, this county, as we have frequently said of late, is to have a large number of quartz mines operating within its boundaries. All the facilities for cheaply working the mines there are at hand. There is plenty of wood and the best of water for steam-power in that part of the county, and water for water-power is abundant. We understand that recently a company of miners, who are working underground in the Idaho mine here, have made locations they consider valuable in Washington township. These men know good quartz when they see it, for they handle that kind every day, and they are very much pleased with the appearances of their Washington township locations.

A GOOD PROSPECT.—*Transcript*, Sept. 22: Charles Grimes, of this city, is the owner of a gravel claim on Deer creek, near Cooper Brothers' saw-mill that promises to be a very valuable property when once opened up. It is the old Cullovan ground. A tunnel of 320 ft in length has been run into the ridge, and an upraise of 20 ft opens into gravel with the bedrock pitching. More tunnel is needed in order to tap the center of the channel, and it will be run in due time. Recent prospects of the dirt yielded well in free gold.

Plumas.

RICH STRIKE.—Greenville *Bulletin*, Sept. 18: Last week Miles Tanner of this place made a discovery of a rich ledge between North fork and Wolf creek, on the North fork slope, about a mile above Minerva Bar, which was worked in early times and paid richly. Mr. Tanner and Mr. Thos. Davis have been searching for the ledge at different times during the past year. On the ground Mr. Tanner picked up a piece of float weighing about two pounds, from which he obtained $30. Previous to this, however, his boy picked up a small piece which he sold for $13. This led Mr. Tanner to sink for the ledge, which he struck a short distance from the surface. It is about 15 ft wide and the indications are that it is a strong ledge. The owners, Messrs. Tanner Davis and Cornell, have prospected the ledge and they are certain that the rock will pay $12 or $15 per ton. They begin work on the ledge to-morrow to make further developments. Mr. Davis has had much experience in quartz mining and he thinks they have a very rich ledge. He thinks the ledge is the same as that of the Crescent and the Indian valley mines. The ore is high grade, the gold being coarse.

San Bernardino.

OCCIDENTAL CHLORIDERS.—Calico *Print*, Sept. 13: Last Monday the leases of about twenty chloriders on the Occidental mine expired, throwing these men out of employment for the present and reducing the life and activity existing in that vicinity during the summer. Ore to the value of $40,000 was taken out in the aggregate by the chloriders, $9,000 being the net proportion received by Mr. Raymond, a handsome royalty for their use of the ground during such a brief time. The majority of the chloriders made a good profit in spite of the heavy expense attending their operations and in half a dozen places rich veins and stringers were being opened when they were compelled to cease their operations and clean up what ore they had in the mine and on the dumps. The chloriders left the mine in good condition and uncovered fine bodies of ore which Mr. Raymond can commence to take out as soon as he sets men to work in these openings, which he will undoubtedly do shortly. In some instances the chloriders threw $75 rock over the waste dump, as it would not pay them wages after they had paid all the expenses of mining, hauling and milling the ore. They owners a handsome profit after all the expenses of developing the mine are paid.

SILVER ODESSA.—Sixteen men are now at work on the Silver Odessa, sinking, running a tunnel and prospecting.

Shasta.

QUARTZ.—*Courier*, Sept. 20: Porter Seaman and the Seaman boys, together with Jewett and Kalbright, own a valuable quartz ledge situated between Rich gulch and Old Churn creek. The ledge varies in width from 14 inches to 5 ft, and is traceable by croppings nearly a thousand feet. A shaft has been sunk on the ledge to the depth of 70 ft, and a tunnel run in on the ledge a distance of 100 ft. This tunnel will be run to the shaft, which, when sunk to the depth of 85 ft, will make connection and serve as a ventilator. The owners have about 400 tons of ore on the dump. This ore is mostly free-milling but some of it contains sulphurets. The ore crushed in an arastra yields nearly $100 to the ton, and Seaman feels confident that if it was worked in a mill and put through a proper amalgamating process it would pay more. Enough of the rock for one run has been hauled to the Jones mill at Lower springs and will afford a fair milling test. Peter and Andy Cusick have been prospecting a claim near the Tower house for several years, and are now rewarded by the uncovering of an ore body which insures them a small fortune, even if no more quartz is found except what is in sight. The quartz pays $20 to the ton and they have a new arastra ready for work. The cost of working the ore will be merely nominal, as the brothers make full hands themselves.

COPPER CITY.—The mines are not run out by any means, as there is plenty of ore in sight. I think Copper City is destined to become the scene of activity and prosperity, for surely some capitalists will invest there. All that is needed is capital to erect new and improved machinery, as the old machinery now on the ground is of an old pattern, which has been condemned for several years. The ore contains a large per cent of copper, as well as gold and silver. The copper has not heretofore been worked as the machinery cannot work both copper and silver.

Sierra.

CANNON-BALL MILL.—Sierra *Tribune*, Sept. 10: C. H. Hankins is here engaged in setting up the Dyer cannon-ball quartz crusher which arrived a couple of weeks ago. It will occupy the vacant lot above Scott's hotel. Mr. Hankin's object in putting up the mill is to give mine owners and prospectors in this vicinity a chance to see it operate and judge of its merits. In other portions of the State a number of these mills are in use and from all accounts they are proving a complete success.

FRUE CONCENTRATORS.—Arrangements are about completed for the placing of eight more Frue concentrators in the Sierra Buttes mill. There are already eight of these concentrators in operation there and they give splendid satisfaction.

FOUND GRAVEL.—On Thursday of this week, a telegram from Supt. W. Lawry to H. T. Briggs, Pres., informed him that the Extension Co. had found the lead on the eastern side of the lava, or deep channel, which they have been so long crossing. Some three weeks ago a chute was started up. At a hight of 50 ft lava was encountered, but as it was raising to the east on the same slope as where the tunnel left it 140 ft back, it proved nothing except that the chute was not far enough away from the lava channel to find the lead undisturbed on its course up the ridge—that is to say, to get away from the eroding influence of the deeper and more modern channel. From the top of the chute a drift was started up the slope between the bedrock and lava. Within a dozen feet washed gravel began to come in, and soon after the bedrock began to pitch, and coarser gravel and water to come in. Where the gravel was struck is about 56 ft above the main tunnel. Had the main tunnel been run 50 ft farther the chute would have raised up in the channel, apparently. The raise is on the South Fork Co.'s ground, about 400 ft from the Extension's southwest line. The course of the channel is north, 45 degrees east, at a right angle to the above line. The company, and the people of Forest city are feeling very happy over the encouraging outlook. The raise is 6,000 ft from the tunnel mouth, at present probably the longest gravel mining tunnel, in the State. A fine prospect in coarse gold was obtained from the first car load washed.

POVERTY HILL.—*Mountain Messenger*: Judson & Kingdon, at Poverty hill, are sinking shafts to prospect their ground, and to ascertain how much their main tunnel, now 3,000 ft in gold Valley flat, is out of grade. About 50 ft from the mouth of the tunnel a shaft was sunk 12 ft through gravel, and no bed rock found. Twenty-five feet further ahead a shaft was sunk 17 ft, with a similar result. The flume is being repaired. Further prospecting will probably be done by sinking another shaft in a more favorable location on the channel. The quartz gravel is fine, and thus far no large boulders have been encountered. The gold is like flour.

took out considerable ore that ranged from $200 to $400 per ton. All the low grade ore left on the mine will pay the owners a good percentage as they can handle it with less expense than was the case with the chloriders.

OCCIDENTAL TUNNEL.—The tunnel which Mr. Raymond started in the Veto claim, and which is intended to open up the Occidental and afford better facilities for taking out the ore and waste from the latter mine is now in the hill 200 ft, and when extended about 50 ft further will be directly under the line of numerous openings made by the chloriders, and when driven 60 ft further in from this line it will be directly beneath the croppings of the ledge. Ore has been struck in this tunnel on the Veto.

GARFIELD.—The Garfield continues to turn out a large quantity of good ore daily. The force has been recently reduced to 30 men. Considerable dead work has been done in the way of running tunnels and drifting. When the ore is once found it is generally traced to some well defined strata or seam, where it can be easily taken out in paying quantities. Work is progressing in the lower tunnel which is in over 400 ft and running westerly. The upper tunnel is in over 300 ft, seams of ore having been intersected. Good ore has been found at a depth of 200 ft which explodes the theory that mineral in that section is confined to a few ft in depth from the surface. The original body of ore struck in the mine, which has yielded so many thousand dollars in bullion, shows no signs of exhaustion, and still yields returns that leave the

STRUCK GRAVEL.—*Mountain Messenger*, Sept. 13: The Germania Gravel Co., location of work on Alabama hill, after remaining idle for several years, started work last spring on a new tunnel. After running 350 ft in bedrock, the company raised a chute last week, and in 15 ft struck gravel and large boulders, with every indication of being in or near the pay channel. If they find what they have every reason to expect, they will have one of the best mines in the county, as the claim is a large one and that section of country, towards Canyon creek, is known to be rich, though this particular locality has not been much prospected. Work has been temporarily suspended at the 1001 mine, owing to a lack of water. The gravel is the best ever found in the mine. The Plumas Eureka Co. are adding new machinery to the Johnstown mill. The Virginia Co., of Howland flat, are reported to be getting very good pay.

Tuolumne.

WHAT A MAN CAN DO.—Tuolumne *Independent*, Sept. 13: Here is evidence of what a practical miner and his boy can do, Mr. John App, owner of the App mine, at Jamestown, started in to build a mill on the 24th of April last with $7.50 in his pocket. On the 5th of August he had it running—5 stamps. He ran 8 days—crushing from 8 to 12 tons of rock every 24 hours, at an expense of $1 per ton. He crushed waste rock, which had been taken out some time ago and dumped, which yielded about $3 per ton. The first run nearly paid for his mill. He is a mill-wright, and did his own work, being out only for the iron work. Being his own superintendent, boss, foreman, etc., the mill did not cost him a fortune; neither did he lay around saloons and curse his d— luck, nor did he offer to sell out for a fancy price. He knew his mine was good, and had the will and energy to work it himself for what there was in it. He says he can mine and mill the rock for $2 per ton, knows where there is better rock, and will go after it, as he can earn the means to do so out of the mine. Times are getting somewhat livelier than they have been at Soulsbyville. About 40 men are now employed at the mine, and work is being pushed as fast as possible. If some rich strikes are made it will be a lively place again. The Rising Sun mine is still shut down and is likely to remain so for some time, as Mr. Comstock, the superintendent, sent on for his things at the mine a few days ago. Rock is being hauled from the Good Friday mine to Soulsbyville to have it crushed.

NEVADA.

Washoe District.

HALE AND NORCROSS.—Virginia *Enterprise*, Sept. 20: Owing to indications of water in the face the main north drift on the 2800 level has been discontinued. They have come back about 20 ft and are now curving the drift to the west. Its course is now about 20 degrees more to the west than heretofore. It was yesterday out 5 or 6 ft. The incline winze is now about 20 ft below the 2800 level. It has passed into quartz, which seems to indicate that the deposit of quartz found on the 2800 level is spreading out to the eastward. The ore body on the 200 level is looking well and the amount of ore extracted has increased to 80 tons a day, or 560 tons a week. The winze is now down 85 ft below this level (the 200) and continues in good ore. Preparations are making for tapping this ore body at the 500 level.

SAVAGE.—Although the course of the large double-track drift on the 2800 level of the Hale and Norcross has been changed and turned 20 degrees more to the west, it is still aimed for the south line of the Savage. Near the old hoisting works, on a level with the branch track of the Virginia and Truckee Railroad, a tunnel is now being run which will tap the same body of ore now being worked by the Norcross folks on their 200 level. It is thought this ore deposit may be as good to the north in the Savage as it is in the Norcross; indeed, no one knows but it may even be better in that direction.

ALPHA.—East cross-cut No. 2, starting from the north end of the lateral drift on the 600 level, has been advanced through 20 ft of black dyke, and after passing through a belt of clay, quartz and vein material of a promising appearance have been encountered. The upraise has now attained a hight of 60 ft. It is following the quartz body found on the 600 level.

OPHIR.—Some ore is still being extracted from the fillings of the old drifts on the 250 level. The west drift on the 500 level has this week been advanced 70 ft. It is now out 593 ft. On the 1500 level the south drift has been extended 65 ft. In the joint Mexican, Sierra Nevada and Union Con. winze, below the 3200 level, but little progress has this week been made in sinking, owing to trouble with the donkey pumps, which have been "bucking." There will yet be three or four ft to sink next week in order to complete the sump below the 3300 level

SIERRA NEVADA.—Repairs to the drift on the 2300 level, through which passes the compressed air pipe, have been completed. They are now repairing the winze connecting the 2300 and 2400 levels, through which passes the same pipe.

BEST AND BELCHER.—The main west drift on the 2500 level is out about 735 ft. It is in a soft vein material, much mixed with stringers of quartz and seams of clay. This drift will be pushed through to the west wall. Rapid progress is making in the north drift on the 825 level, which is passing through vein material of a promising character. In due time cross-cuts will be run from both these drifts.

ALTA.—The main east drift on the 2150 level has about 50 ft to go to tap the vein. Work in the drift was discontinued for two or three days, during which time a drain was cut and boxes put in for the purpose of carrying off any water that might be tapped on cutting into the vein. A branch drift is being run to the northeast to tap the vein in Benton ground.

CON. VIRGINIA AND CALIFORNIA.—On the 1750 level the main drift has been cleared out and retimbered a distance of 350 ft west from the C. and C. shaft. From this they are now running a drift to the northwest in new ground. This drift is in favorable material and is out between 30 and 40 ft.

BENTON.—Work to the west on the 2150 level has been discontinued and a drift has been started northeast from the main east drift of the Alta. It is expected that this and the Alta drift will tap the east vein at about the same time.

CHOLLAR.—Excellent progress is being made in sinking the Chollar-Norcross-Savage shaft toward the 3000 level. It is now down about 2,955 ft.

CROWN POINT.—A considerable amount of ore of low-grade is still being found, and some prospecting is being done to open out further supplies. The water supply in the Carson river is falling off somewhat, and the mills cannot be run to their full capacity.

YELLOW JACKET.—A sufficient amount of ore is still being found to keep the mills on the Carson river at work.

UTAH.—The southeast drift on the 1950 level is still in the belt of hard porphyry mentioned last week. A favorable change is expected when this has been cut through.

BELCHER.—The old upper levels are still yielding a considerable amount of low-grade ore, and the prospecting drifts are presenting a favorable appearance.

ANDES.—Some low-grade ore is being extracted, and a good deal of prospecting is being done in deposits of quartz that are mineral-bearing.

Belmont District.

BELMONT.—*Courier*, Sept. 13: Have extracted the usual quantity and quality of ore during the past week. Have opened another stope, No. 5, which shows 2 ft of ore in the face. No. 1 stope is widening to the south. Ore is from 4 to 6 feet in thickness. All other stopes remain unchanged. Mill running well; average chlorinations, 93 per cent. Shipped 2 bars on the 10th; value, $2,408.18.

Bernice District.

MINERS.—Eureka *Sentinel*, Sept. 13: William McEwen, who has returned from Bernice district, which is some 60 miles east of south from Lovelock's Station on the C. P. Railroad, in Churchill county, tells us that there are 50 miners in the camp on day's pay, half of them working in the company's mine, the Goodwell, and the other half working at the mill. The mill hands get $3 a day and the men in the mine get $50 a month and board. McEwen says the mine is a good little property. It has made two shipments of bullion—$7,000 and $4,000—and this when it had been worked but little more than a month. The mine is stripped for a distance of 1,500 ft, and is worked by tunnels, the lowest one of which penetrates the ore body 500 ft below the surface.

Columbia District.

MOUNT DIABLO.—Candelaria *True Fissure*, Sept. 13: The east drift on the fifth level has connected with the incline and a chute will be put in in a few days. The incline is now 312 below the third level. In the east drift on the fourth level, 60 ft of track have been put in during the week, and the west drift on the second level has advanced 17 ft, and shows ledge matter in the face. The workings about winze No. 5, are giving a little ore of good grade. Winze No. 7 is now down 44 ft. The west intermediate, between the second and third levels, shows some 6 inches of $80 ore, and there is a small streak of $50 ore in the east intermediate between the same levels. In the west intermediate, between the first and second levels, a north cross-cut 27 ft long has cut a ledge of $40 ore. A small amount of ore is being taken from the east drift on the first level.

Cortez District.

LOOKING WELL.—*Silver State*, Sept. 18: J. W. Snowden, of Cortez district, was in town yesterday. He says the mines in that section are looking well. S. Wenban, owner of the Cortez mine, is building a new 15-stamp mill, and has brought water in pipes to the mill site from springs seven miles away. W. T. Clark, formerly of this place, has discovered a

very rich lead in the district, and is taking out ore that assays very high in silver.

Mount Hope District.

IMPROVEMENT.—Cor. Eureka *Sentinel*, Sept. 13: I find, after two months have passed since my last visit to this promising mining region, a marked improvement and worthy of note. Mr. Wren is doing a large amount of dead work to improve his property. He is working nine men, seven on tribute and four doing prospect work. The portion of the mine let to four practical miners shows a face and breast of ore nine by six ft, at a depth not exceeding 20 ft from the furface, and they can take out from three to five tons per day. The outlook at Mount Hope is flattering. Mr. Wren is preparing for extensive work. He has contracted for the building of winter quarters—a dwelling and boarding house, blacksmith shop, etc.

Philadelphia District.

PUSHING WORK.—Belmont *Courier*, Sept. 20: The Belmont Mining Co. is pushing the work of development vigorously in their mine at Philadelphia district with flattering results. This company has also a force of miners employed in the Barcelona at Spanish Belt and considerable very fine ore is exposed to view in that mine. Superintendent N. C. Fassett is well pleased with the prospects. The mill and leaching works are running nicely and the bullion produced is very fine.

Sherman District.

HOISTING WORKS.—Reno *Journal*, Sept. 16: Farmer Burke and Dr. Brooks, of White Pine county, arrived in Reno, Friday. Both gentlemen are largely interested with James Burke in his mines in Sherman district. They are here for the purpose of arranging to erect hoisting works on the mine and to prosecute the work of development on a more extensive and systematic scale. The developments at the bottom of the 80-ft. shaft are wonderfully encouraging. The ore body had just been cut when the miners were driven out of the shaft by water. It is the intention now to erect proper hoisting works and put in a pump so as to avoid further interruption.

ARIZONA.

COPPER.—*Silver Belt*, Sept. 20: The Old Dominion Co.'s works are running smoothly under the new administration. We are informed that a great deal of extra timbering has been done in the Old Globe mine since Sept. 1st, which greatly adds to the safety of the men employed in the mine. Work in the main shaft, cross-cuts and drifts, is being energetically pushed and the mine opened to the best advantage. The outlook in the ore bodies is satisfactory and the result of prospecting with the diamond drill unquestionably proves their continuance. There are other copper properties in this district which if developed, we are confident would prove as valuable as the Old Globe. What is needed to make this the greatest copper producing district in the world is a reduction in the cost of coke, which can only be accomplished by the construction of a railroad and consequent lessening of transportation charges.

TOMBSTONE MINES.—Cor. Prescott *Courier*, Sept. 18: The mines, from which Tombstone derives its principal support are: The Contention, which is opened to a depth of 750 ft, 150 ft below the water level. Grand Central, opened 600 ft in depth. The Tombstone Mill and Mining Co.'s properties are: The Tough Nut, Good Enough, Lucky Cuss, West Side, all of which have yielded well. Vizina Co. own the Way Up, Stonewall, Rattlesnake, Maine, Luck Sure, Tranquility, Head Centre, Ground Hog. The mines named have paid, since 1879, about $10,000,000, and are certain to yield treble that amount. Cochise county has about 100 more mines, which have "paid their own way." The Emerald, another fine property, will very soon have immense hoisting works. Mr. Gage, Supt. of the Grand Central, had about 350 men employed when we were there. Wages, $3 a day. Other superintendents were preparing to resume, and people told us that fully 1,000 miners would be working by October first. In some mines the ore bodies were 200 ft thick; ore free milling. Some of the mines are in limestone; others in porphyry. The mills of Cochise are the finest in the southwest. The general impression was, that, instead of being exhausted, the mines of Tombstone and vicinity are just scratched.

A NOTABLE STRIKE.—*Enterprise:* One of the most notable strikes of the season was made some ten days ago near Riverside, 30 miles from Florence, opposite the Ray smelter, on what is known as the Richard III. An iron ledge, 10 or 12 ft wide, showing some stains of copper, had never been explored. This year the owners, Peter Will and John Ruckleshausen, decided to work on it, and after penetrating the solid iron for some 6 ft, they were rewarded with a sight which was simply magnificent. The ore changed to a solid mass of carbonate ore running from 30 to 70 per cent copper and 10 to 20 ounces in silver to the ton. The ore body was penetrated 16 ft, with a shaft 4 ft in width, all ore and no wall on either side. Work will be resumed as soon as a windlass can be put in place. If the mine produces in the future as it has done for the last week it will be an exceedingly valuable property, being within a stone's throw of the smelter, which must eventually have this species of ore to smelt the concentrations from the Ray mine.

QUIJOTOA'S PROSPECTS.—Cor. Tucson *Sunshine and Silver*: It makes a man feel very blue to look down our mile of deserted street, lined by empty houses. Much faith is needed as well as hope. They are employing a few more men on the "bonanzas"—which have not yet earned that name, by the way—and seem to be awaiting the result of what they may find in Peerless tunnel No. 1. We need to give more attention to outside claims, and should have done so had we not been entirely blinded by the glamor of the "bonanzas." The Town Well people are sinking more rapidly in softer rock. They now make rapid progress, and the water has risen 250 ft in the well. Mr. Quiggle has been in conference with the superintendent of the mines, on the subject of the company's using this water, should hey build a mill; otherwise the town-site company will probably have a 5-stamp custom mill erected. A good idea. They also need such a mill badly at Covered Wells, where constant fresh discoveries of narrow but very rich veins are being made. Ore is being sacked there that averages $1 a pound. They say the stock of the North Peer is to be pooled in San Francisco and work thereon started. Quijotoa will be made a sort of headquarters for work on the Gunsight. The Silver Bullion mine, mill-site and town-site have been surveyed.

COLORADO.

GENERAL NOTES.—Colorado *Mining Gazette*, Sept. 13: All the mines on Seaton mountain worked under lease are paying well. So far this month there has been received at the Public Sampling works 100 tons of ore. Lode No. 1, a blind lode cut in the Foxhall tunnel, has a streak of solid ore, 5 inches, that assays in the hundreds. The August shipments from Georgetown amounted to $75,000. Silver Plume footed up for the same month $45,000. From 12 to 14 inches of nearly solid gray copper was exposed in the shaft of the Gem mine, Seaton mountain, on Monday last. The new mill now under construction at the head of Fall river, by Mr. Choate, for John Owens, is fast drawing to completion. The mill will be running in the course of two weeks. Quite a number of Ute creek properties have changed hands of late; these transfers, together with the many claims which are working under lease, give new life and energy to the camp. A shipment of ore from the Grand View lode, on Seaton mountain, to the public Sampling works ran, one ton of first class, $157; two and one half tons second class, $120. This ore was extracted by the leasers in 17 days. W. A. Doyle, who has been prospecting near the Brazil lode in Bullion camp, made a good discovery this week. The crevice is 3 ft between walls. The pay streak of 6 inches shows galena with blue and green carbonates of copper.

IDAHO.

TO RESUME RIVER MINING.—Nevada *Transcript*, Sept. 20: Supt. Emery of the Yuba River Tunnel M. Co., whose flume at Hoyt's old crossing was broken last winter, permitting many blocks to be washed away and causing a suspension of work for the season, yesterday let a contract to repair the flume and furnish 2,000 blocks for it. The flume will be ready in two weeks to resume mining.

THE VIENNA MILL.—Wood River *Times*, Sept. 16: Many more men and a greater number of families will winter in Galena this year than last. A good strike of rich ore was recently made in the Senate mine, which has given all the camp renewed hope, and several mining men who were hesitating are now laying in supplies to work all winter. More men are at work in and around Galena than ever before. Colonel Broadhead is doing very well with the Blue Jacket mine, near Boulder, the ore being much richer than that heretofore encountered. He has already shipped 140 tons this season, and is now shipping a pack-train load per day to the Philadelphia Smelting works. As others are also making regular shipments from Boulder, there is quite an excitement at that station. At Vienna the entire 20 stamps of the mill are kept busy, and yielding an average of two bricks of bullion per day, worth $1,300 to $1,500 each. A lot of Lucky Boy ore is being received for working. The owners of the mill intend to run it all winter, and to that end are getting in salt and other supplies. They already have a perfect mountain of cordwood.

A PROMISING IRON MINE.—Wood River *Times*, Sept. 16: J. Z. White is diligently at work on his iron mine up the East fork. A tunnel is being run to tap the main ledge, which will be reached in about 10 days. The Occident is an extensive lead of excellent iron ore, and increases in size and richness from the surface down as far as worked. So far there is an almost total absence of any other mineral in the ledge, but the iron itself is of a quality to inspire the owners with the brightest hopes. Work will be suspended during the winter.

CŒUR D'ALENE.—Salt Lake *Tribune*, Sept. 10: Major W. W. Woods returned several days ago from the Cœur d'Alene country. He is very sanguine as to the prospects of this new district, believing it to be one of the best of the few remaining gold districts of the country. He was met by a reporter yesterday, and in response to the question as to whether there were many paying mines there, replied. "Yes, there are quite a number. One or two claims are paying as high as $5,000 a week, and there are a number that pay from $1,000 to $4,000. The Mother lode was recently bonded for $75,000 to Leadville parties, and large forfeit money was paid down. Another claim was recently sold for $30,000, and sales are constantly taking place. Many men who own claims are too poor to work them, and in many instances there is not enough water at present to work them, even if they had the money. The claims, which are twenty acres in extent, are too large for one man to handle, and that also has a tendency to keep men from working them. A great many claims will be jumped about November, especially those on which no assessment work has been done during the past year. A number of the men who have been working on the ditches during the summer, and a number of speculators are leaving for the winter, but otherwise there appears to be no exodus. Business appears to become more and more stable every week and people who are there seem satisfied and want to remain. Everybody appears to be hopeful and there is scarcely a doubt but that the country will be a big one when it is once properly developed."

MONTANA.

AMONG THE MINES.—Butte *Miner*, Sept. 17: The Rainbow lead belongs to Walker & Co. It was located by Charles Savage in 1875, and has not yet been patented. It has been regularly represented every year since it was located. It is east of Meaderville, at the foot of the range. It has been prospected by two shafts. The ledge on the surface is 8 ft wide. The owners are now running a tunnel into the mountain to tap the ledge. The tunnel is now about 40 ft long. The ore is low-grade. The La Plata is at the top of the hill above Centerville, just west of the road to Walkerville. It used to be called one of the best mines in the camp, and doubtless is a first-class mine. It has not yet been thoroughly prospected. True, the main shaft is now 800 ft down on the ledge and the upper stopes pretty well worked out, but the lower levels have not been well prospected. Work is now going on in all the stopes. The main shaft is worked with a steam hoist. There is a shaft on the west end of the lead about 80 ft deep, which is worked with a whip. Drifting is going on in this shaft on the 65-ft level. The Lexington is one of the best silver mines in the world, and is too well known for any extended description to be made of it at this time. The shaft has been sunk 650 ft. At that depth the shaft is supposed to be about 250 ft from the vein. Cross-cutting is now going on on that level to tap the vein. Ore is being taken out from the 200, 300, 400 and 500-ft levels. They take out about 1,850 tons a month. About 160 men are employed in and about the mine. About 225 are employed in the mine and mill. At the Alice they are blasting away the rock just east of the shaft to get a place to set a large Cornish pump. Evidences of prosperity are on every hand about this mine and mill. It is as good a silver producer as any mine in the district. Its shipments of bullion every week show this. For the week ending September 13, 1884, its shipments of bullion aggregated $26,412. Besides this there were 12 bars in the safe in the office of the company yesterday afternoon, part of the production of the week that was not shipped. The mine may not be looking well—the reporter did not see it—but it certainly is producing well. The Moulton is looking well, and the mill is kept well supplied with good ore. Work is going on, and ore is being taken from the 300, 400 and 500-ft levels. The shaft is 500 ft deep. The quantity of water that has appeared in the mine has much diminished. The big Cornish pump is getting lazy; it has comparatively little to do now. The Margaret Ann is a lead that promises well. It has been worked with a shaft 80 ft deep which goes down on the lead. At this depth a level has been run 70 ft east and 40 ft west. At that depth the vein shows 8 ft of ore, 4 ft of which is high-grade. A two-compartment working shaft 100 ft deep has been contracted for; it is now about 40 ft deep. As yet, the mine is worked by a windlass. When the present contract for sinking has been filled a fine steam hoist will be put up. The Margaret Ann belongs to the Maryland and Montana M. Co. Mr. J. G. Hammer is the general manager. The company have such faith in their mine that they have contracted with Tuttle & Co. to erect and complete a 15-stamp mill. It is to be a dry-crushing mill with Howell chloridizing furnace. The Orphan Girl is now a well-known ore producer in this district. The shaft is 150 ft deep. At 170 ft a level has been run about 25 ft. The ore on that level is base. Free-milling ore at the rate of 30 tons a day is being taken out from the 90 ft level.

THE ANDERSON CONCENTRATOR.—Butte *Miner*, Sept. 13: This new concentrator has been working for some time on the tailings of the Dexter mill, and has been proving itself the best machine of the kind ever set to work in Butte. The mill has been at work on ore from the Orphan Girl and has now several hundred tons of tailings from that mine. The mill saves between 70 and 80 per cent of the assay value of the ore. The concentrator now works the tailings so nicely that in every ton of concentrates is found 65 per cent of carbonate of lead and 45 ounces of silver. Also in every 10 hours' work the concentrator saves from the tailings from $10 to $20 worth of amalgam. Three tons of concentrates are turned out in 10 hours' work. About 50 tons of tailings are worked in the 10 hours. In other words, from 15 to 18 tons of tailings are used to every ton of concentrates.

NEW MEXICO.

THE ORGANS.—Cor. Rio Grande *Republican*, Sept. 13: Strange faces begin to appear among us, who look like men that mean business. Mr. Baggs has improved machinery on the way to push development on the Galloway. The May Flower has resumed operations under contract. The Black Prince is putting on the dump from 5 to 10 tons of fine carbonate ore per day, and 5 teams are kept busy hauling it to the smelter. The Montrose has reached a considerable depth, and is showing up fine specimens of sulphurets. The Climax is a claim of special interest, well defined between walls, with 3 inches of talc plastered on the walls. Black sulphurets of good grade is the character of the mineral. The Anna Parker, one of Dallores' supposed abortions, has been sunk by the present owners, and shows a fine body of chloride and carbonate ore. The Gray Eagle, of historic fame, is an incline tunnel, and has reached a depth of 110 ft, and within the past 10 days, by the labor of 3 men, a sufficient quantity of high-grade sulphurets has been sacked to make a handsome shipment.

SHAKESPEARE.—Lordsburg *Advance*, Sept. 13: Shakespeare is very dull at present, owing to the mines not being worked (the mines never did receive much work; it was generally the stockholders that got worked), and is likely to remain so for some time unless men who invest procure the services of some good mining man. Pumpkin growers and pill-makers seldom know much about mining.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Arnold G & S M Co	Arizona	2	50	Aug 1	Oct 1	Oct 28	A Judson	320 Sansome st
Alta S M Co	Nevada	30	50	Aug 21	Sept 25	Oct 15	W H Watson	302 Montgomery st
Andes M Co	Nevada	25	25	Sept 23	Oct 28	Nov 20	B Burris	309 Montgomery st
Cuevu Santa M Co	Mexico	3	05	Sept 13	Oct 15	Oct 31	W L Oliver	328 Montgomery st
California M Co	Nevada	13	20	Aug 4	Sept 11	Oct 8	C P Gordon	309 Montgomery st
Champion M Co	California	15	10	Aug 22	Sept 25	Oct 16	T Wetzel	522 Montgomery st
Con Imperial S M Co	Nevada	21	10	Sept 1	Oct 7	Oct 28	C L McCoy	309 Montgomery st
Excelsior W & M Co	California	7	50	Sept 2	Oct 7	Oct 28	W J Stewart	215 Sansome st
Eintracht Gravel M Co	California	16	05	Aug 26	Sept 1	Oct 18	H Kunz	209 Sansome st
Equitable Tunnel M Co	Utah	30	40	July 23	Sept 15	Oct 7	W A Van Bokkelen	419 California st
El Dorado Con M Co	Nevada	3	04	Aug 16	Sept 19	Oct 8	H Sayre	330 Pine st
Enterprise M Co	California	1	15	July 1	Sept 13	Oct 4	W Van Bokkelen	419 California st
Golden Fleece G M Co	California	33	50.00	Aug 6	Sept 10	Sept 27	F Schemaler	412 Sixth st
Indian Spring Drift M Co	California	3	03	Sept 17	Oct 18	Nov 15	A B Paul	328 Montgomery st
Justice M Co	Nevada	41	15	Sept 11	Oct 11	Nov 5	R E Kelly	412 California st
Martin White M Co	Nevada	18	25	July 25	Sept 4	Oct 2	J Scoville	309 Montgomery st
North Gould & Curry M Co	Nevada	7	25	Sept 3	Oct 5	Oct 23	C H Mason	331 Montgomery st
Solid Silver M Co	Nevada	4	10	Sept 23	Oct 25	Nov 12	R Hewson	5 First st
Sterling M Co	California	1	05	Sept 18	Oct 23	Nov 20	W H Allen	306 Pine st
Savage M Co	Nevada	60	50	Sept 5	Oct 7	Oct 27	E B Holmes	309 Montgomery st
Summers Con M Co	California	1	05	Aug 18	Sept 22	Oct 13	F E Luty	330 Pine st
Summit M Co	California	7	05	Aug 4	Sept 8	Sept 29	G W Sessions	309 Montgomery st
Utah S M Co	Nevada	50	50	Aug 18	Sept 22	Oct 11	G C Pratt	309 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Mayflower Gravel M Co	California	J Morizio	328 Montgomery st	Annual	Oct 6

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	G W Sessions	309 Montgomery st	50	June 5
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Aug 26
Idaho M Co	California			4.00	Apr 2
Jackson M Co	California	D C Bates	309 Montgomery st	10	Mar 16
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 21
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Apr 28
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Mar 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Sept 5

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept. 5.		WEEK ENDING Sept. 11		WEEK ENDING Sept. 18.		WEEK ENDING Sept. 25.	
Alpha	1.60	2.00	1.45	1.65	1.50	1.65	1.40	1.60
Alta	2.10	2.30	1.95	2.45	1.60	2.35	1.65	2.20
Andes	.20	.25	....	.20	.25	.20	.20	.25
Argenta	....	.15	....	....	....	....	....	....
Belcher	.30	.90	.80	.90	.80	....	.80	.80
Beldlig	....	....	....	....	....	....	....	....
Best & Belcher	2.30	2.45	2.30	2.50	2.20	2.40	2.15	2.30
Bullion	.50	.60	....	.45	....	.50	....	....
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	.60	.65	.55	.60	....	.55	.55	.60
Bodie Con	1.65	1.95	1.95	2.15	2.00	2.05	1.95	2.10
Benton	.50	.65	.55	.70	.50	.70	.50	.50
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	....	....	....	....	....	.50	....	.55
California	.10	.15	.15	.55	.30	.35	.30	.35
Challenge	.20	.25	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Chollar	3.60	3.00	2.15	2.70	2.20	2.45	2.10	2.50
Confidence	....	1.00	....	....	....	1.60	....	1.00
Con. Imperial	....	.05	....	....	....	....	....	....
Con. Virginia	.25	.35	.25	.30	.20	.25	.20	.25
Con. Pacific	.55	.60	....	.60	.60	.65	.60	.80
Crown Point	1.30	1.40	....	1.25	1.30	1.35	....	1.30
Day	....	....	....	....	....	....	....	.35
Eureka Con	....	2.50	....	....	2.75	3.00	3.25	3.30
Eureka Tunnel	....	.55	....	....	....	....	....	....
Exchequer	.40	.45	....	.40	.35	.40	.30	.30
Grand Prize	.30	.50	.40	.45	....	.40	.40	.45
Gould & Curry	2.00	2.40	1.95	2.25	1.95	2.15	1.80	1.95
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	3.10	3.60	2.75	3.35	2.85	3.25	2.85	3.25
Holmes	....	....	....	2.60	....	2.75	....	....
Independence	....	....	....	....	....	.25	....	....
Julia	....	....	....	....	....	....	....	....
Justice	.15	.20	.15	.25	....	.20	....	.15
Mammoth	....	.30	....	....	....	....	....	....
Mono	.60	.65	.70	.95	.90	1.40	1.05	1.40
Mexican	1.50	1.70	1.50	1.60	1.60	1.85	1.55	1.80
Mt. Diablo	....	2.25	....	....	....	....	....	....
Northern Belle	....	....	....	....	....	....	....	....
Navajo	3.50	4.15	3.60	3.90	3.55	3.90	3.60	3.75
North Belle	....	....	....	....	....	....	.30	.40
Occidental	....	1.10	1.10	1.15	1.30	1.60	1.30	1.40
Ophir	1.10	1.25	1.10	1.25	1.30	1.40	1.30	1.40
Overman	.15	.80	.15	.20	....	.15	.20	
Potosi	1.05	1.75	1.35	1.65	1.35	1.60	1.30	1.50
Final Con	....	....	....	....	....	....	....	....
Savage	1.25	1.70	1.20	1.40	1.20	1.45	1.25	1.40
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	1.45	1.65	1.35	1.50	1.45	1.60	1.40	1.65
Silver Hill	....	....	....	.10	....	.10	....	.05
Silver King	....	4.50	....	....	....	4.50	....	....
Scorpion	.25	.30	....	.25	....	.25	....	.20
Syndicate	.45	.55	....	....	....	.45	.40	.45
Tioga	....	.05	....	....	....	....	....	....
Union Con	1.15	1.30	1.15	1.20	1.25	1.35	1.25	1.35
Uta	1.00	1.15	.80	1.00	.70	.95	.75	1.30
Yellow Jacket	1.70	1.80	....	1.75	1.95	2.00	1.75	2.00
	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Sept. 18.

				AFTERNOON SESSION.			
850	Alta	1.95	2.00	20	Alpha		1.50
50	Andes	.15c	820	Alta		2.05	1.70
190	B. & Belcher	2.05	2.10	150	Andes		15c
350	Benton	.50	55c	20	Alpha		1.50
40	Bodie	2.00		50	B. & Belcher		2.20
300	Belle Isle	.55c		160	Benton Con		55c
1000	Crown Point	1.30		50	Bodie Con		2.00
250	Con. Pacific	.60c		150	Chollar	.230	2.35
150	Chollar	2.10	2.15	250	Gould & Curry		1.80
150	Exchequer	.30c		50	Grand Prize		.40c
300	Gould & Curry	1.60	1 65	200	Hale & Nor		3.05
300	Hale & Nor	2.90	2.95	150	Holmes		1.75
50	Holmes	2.75		100	Justice		15c
150	Mono	1.30		200	Mexican		1.70
250	Mexican	1.55		100	Mono		1.30
200	Navajo	3.60		100	Mt. Diablo		2.40
200	N Belle Is	.40c		300	N. Belle Is		40c
200	Ophir	1.15		250	Ophir	1.25	1.30
15	Overman	.15c		20	Potosi		1.35
600	Potosi	1.30	1.35	120	Sierra Nevada	1.40	1.45
650	Savage	1.10	1.20	400	Syndicate		.45c
50	Sierra Nevada	1.35		100	Utah		1.30
250	Union	1.20		400	Union	1.25	1.30

Bullion Shipments.

Day, Sept. 16, $4,255; Hanauer, 16, $5,800; Wood River, 16, $3,500; Ontario, 16, $16,424; Horn Silver, 16, $24,000; Hanauer, 17, $1,850; Nevada ore, 17, $1,200; Horn Silver, 17, $12,000; Vienna, 17, 3,071; Nevada ore, 18, $3,900, Horn Silver, 18, $9,000; Ontario, 18, $4,222; Hanauer, 19, $3,800; Horn Silver, 19, $12,000; Ontario, 19, $5,858; Hanauer, 20, $3,500; Stormont, 20, $3,450; Wood River ore, 20, $6,110; Horn Silver, 20, $6,000; Ontario, 20, $7,042; Vienna, 20, $2,957; Day, 21, $4,196; Horn Silver, 21, $9,000; Ontario, 21, 5,841; Vienna, 21, $2,983; Carlisle (N. M.), 20, $28,000; Silver King, 20, $17,975; Garfield, 20, $6,546; Grand Prize, 19, $6,000. The banks of Salt Lake City received for the week ending September 17th, inclusive, $148,205.36 in bullion, and $12,538 in ore; a total of $152,743.36.

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MANUFACTURERS OF IMPROVED AND APPROVED FORMS OF

MILL AND MINE MACHINERY.

Having made extensive additions to our Shops and Machinery, we have now the LARGEST and BEST APPOINTED SHOPS in the West. We are prepared to build from the Latest and Most Approved Patterns,

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For working gold and silver ores by wet or dry crushing. The Stetefeldt, Howell's Improved White, Brunton's & Bruckner Furnaces, for working base ores. Rotary Dryers, Stetefeldt Improved Dry Kiln Furnaces.

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Frue Ore Concentrator, or Vanner Mills.

Coarse Concentrating Works, Improved Jigs, Crushing Rollers, Sizers, Trommels, Rittenger Tables, and all other adjuncts for the proper working of Gold, Silver and Copper Ores, complete in every detail.

HALLIDIE IMPROVED ORE TRAMWAYS. We refer to Gen. Custer mine, Idaho, 5,000 feet long; Columbus Mine, Col., 4,750 feet long; Mary Murphy mine, Col., 5,000 feet long, all in constant operation.

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Improved Corliss and Plain Slide Valve Meyer's Cut-off Engines.

CORLISS ENGINES from 12x36 Cylinders to 30x60. PLAIN SLIDE VALVES from 6x10 to 36x36. BOILERS of every form, made of Pine Iron Works C. H. No. 1 Flange Iron, or Otis Steel. Workmanship the most careful. All Rivets Hand Driven.

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WE ALSO IMPORT

LARD OIL, WEST VIRGINIA LUBRICATING OIL, DOWNER'S MINERAL SPERM SKID OIL, ETC.

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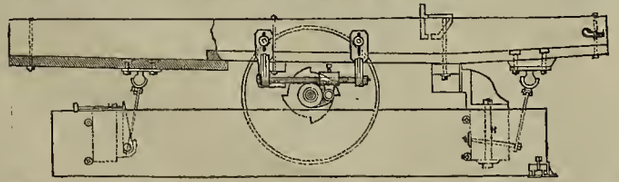

This machine requires less power, less care or attention, and is less liable to get out of repair than any Concentrator now in use. All of which any practical miner will comprehend when seeing it in operation.

The wear and tear is nominal, and the construction so simple that any miner can put it up and run it; and the low price brings it within the reach of all millmen, as it will save enough to pay for itself in any mill in a very short time. One machine will concentrate the tailings from a five-stamp battery.

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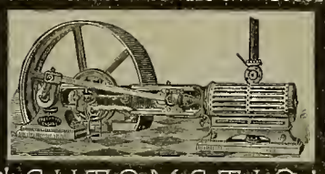

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The "Old Reliable,"

With Important Improvements, making it the

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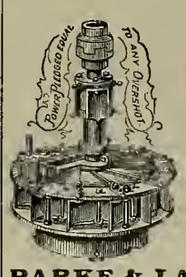

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Those improving water power should not fail to write us for **New Prices,** before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address

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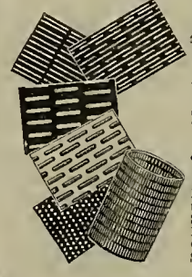

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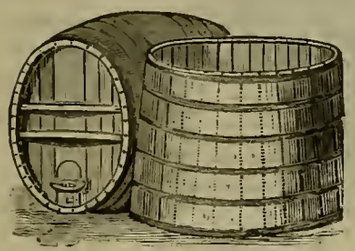

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PREVENTS LEAD POISONING AND SALIVATION.

Invaluable to those engaged in dry crushing quartz mills, quicksilver mines, white lead corroding, feeding thrashing machines and all occupations where the surrounding atmosphere is filled with dust, obnoxious smells or poisonous vapors. The Respirators are sold subject to approval after trial, and, if not satisfactory, the price will be refunded.

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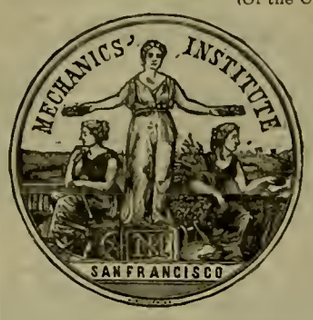

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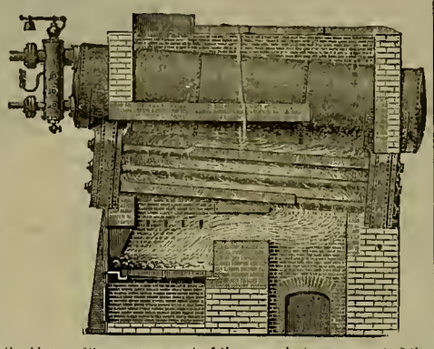
Economy in space and fuel. Safety at high pressures. Freedom from scaling. Equally adapted for power and heating purposes. Especially adapted for mills, factories, hotels, stores or any place where safety is a necessity. Will work well with muddy water and any kind of fuel.



TESTIMONIALS.

ST. LOUIS, Mo., Sept. 28, 1883

Messrs. Adolphus Meier & Co. — GENTLEMEN: We cheerfully certify that the "*Heine Patent Safety Boiler*" put up by you in our establishment has proved very satisfactory in its working. The chief points of excellence in the "Heine Safety Boiler" are its economy in fuel and space, freedom from scaling, aptitude for power and heating purposes, working equally well with clear and muddy water. We warmly recommend it to all using steam machinery. Yours truly,

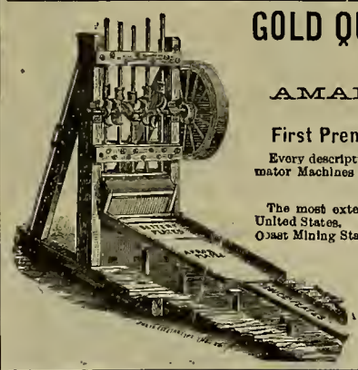
ANHEUSER BUSCH BREWING ASS'N.

OFFICE OF SUPT OF ROYAL RAILWAYS,
BERLIN, Sept. 23, 1883.

To Mr. H. Heine, Civil Engineer: In reply to your inquiry of September 2d, we respectfully inform you that the three boilers built under your patents, under steam since September 29, 1881, at the Alexander Place Depot, as well as the two at Friedrich Strasse Depot, under steam since September 22, 1882, have given good satisfaction, requiring no repairs whatsoever to date. The internal cleaning of the boiler was always accomplished with ease on account of the convenient arrangement of the tube caps, the adhesion of scales being fully prevented thereby, and the boilers kept in prime condition.

(Signed): BRAUCKE.

Send for Circular and Prices.



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Silver Plated

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Every description of plates for Quartz Mills and Wet or Dry Placer Amalgamator Machines made to order, corrugated or plain.

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Gold Silver and Lead Ores and Sulphurets.

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Mining Engineers and Metallurgists.

Mechanics' Institute Medals.

(*Continued from page 197.*)

Heckmann, ivory and wood carving. Miss Susie Sroufe, best Barbotine work. G. F. Sala, display of marble statuary,

CLASS 45—Miss C. E. Usber, portrait in ink, crayon portrait Bishop Kip.

CLASS 47—Mrs. W. H. Ware, floral design, "balloon." Miss Marie Seitz, floral bouquet. G. W. Hinclay, display of fruit.

Diplomas.

CLASS 1—Downie Boiler and Incrustation Preventive Co., scale preventive. W. T. Garratt, lubricator. H. Slocomb, lubricator. John Mailler, improved grate bar. Tucker & Saulsbury, lubricator.

CLASS 3—Clott & Meese, best shaft coupling.

CLASS 4—H. P. Gregory & Co., tenoning machine, sand-papering machine, mortising machine.

CLASS 5—Adam Good, patent bung starter. B. F. Carman, cable grip for turning curves. D. S. Ciphers, machine for pop-corn balls. J. J. Cousins, candy twisting machine. Gillispie & Childs, Hall type writer. Potipbar Stolid, Jennies' interest indicator. A. Scburch, milling machine and dental and mining drill. Wales Manufacturing Co., car-fare box and change gate. C. S. Wescott, sash steadier. G. G. Wickson & Co., Remington type writer, pneumatic copying press.

CLASS 6—Geo. Johnson, quicksilver feeder.

CLASS 8—M. Scbool, fire escape. O. Hansen, permanent fire escape. Chas. F. Shore, portable fire escape. H. H. Gross, Harden haud grenade.

CLASS 11—Judson Manufacturing Co., best mower (the Victor). Baker & Hamilton, lawn mower. Geo. Bull & Co., broadcast seeder. P. P. Mast & Co., walking cultivator. Hawley Bros. Hardware Co., corn planter. Geo. Bull & Co., sulky plow. Ira P. Kilgore, side hill plow. Baker & Hamilton, Moline plow. P. P. Mast & Co., seed drill. G. G. Wickson & Co., hand churn. August David, grape stemmer and crusher. P. P. Mast & Co., wine or cider press and crusher combined. Geo. Bull & Co., hand corn planter, fanning mill. A. C. Swingle, pea sheller (haud or power). F. Moline, hand pea sheller. J. A. Bilz, vineyard plow, whiffletree for vineyards and orcbards. G. G. Wickson & Co., display of dairy implements. Wm. Knapp, side hill vincyard plow. D. C. Kingsbury, self-acting gate.

CLASS 13—S. B. Laughlin, Royal baklng pans. L. H. Moise, patcut fruit steamer.

CLASS 14—Mrs. F. M. Truworthy, stencil plates. L. H. Moise, changeable rubber type.

CLASS 17—Charles Sutton, artificial stone, stamped. San Francisco & Pacific Glass Works. California engraved glass ware. B. Nathan & Co., engraved glass ware. International Tile Co., display of tiles. P. H. Jackson & Co., glass pavement.

CLASS 18—J. S. Tibbals, sewer trap. Emile Boesch, specimens of metal spinning. Alfred Thurber, Concord, Contra Costa county, automatic lamp bracket. M. Metzger, patent gas lighter. D. S. Browu & Co., duplex gas burner. B. F. Busb, automatic gas burner. C. H. & G. W. Burr, slop hopper. Geo. C. Thompson, soda fountains. Albrecht & Waters, stove-pipe shelf and support, steel-edge dust pan. Dutton & Son, patent gas key.

CLASS 19—C. Weston, display of the Arch fire kindler. J. Hatch, samples of shaper work and sawing. T. Duffy, rustic work and gas logs. C. H. and G. W. Burr, weather strips. J. W. E. Howe, imitation wood and marble table tops. Geo. P. Ashton, portable conservatory. Louis L. Hall, specimens fret sawing. Mrs. Harrict W. R. Strong, Bedford window attachment. Geo. F. Atkinson, articles turned from Pacific coast woods. Atwell Manufacturiug Co., sash lock and ventilator.

CLASS 21—M. J. McCue, carriage blacksmitbing. Waterbouse & Lester, wagon wheel. F. C. Milliken, dump-wagon. R. N. Coughell, spoke extractor. A. W. Sanborn, display of imported wagon work. J. McLaughlin, improved shaft or thill coupling.

CLASS 22—F. Rentzcheller, carpet rockers. C. H. Townsend, kitchen tables. Fay & Co., extension tables. Otto Einhoff, inlaid secretary. Pacific Spring and Mattress Co., Turkish chairs. T. S. Clark & Co., wire-coiling machine, carpet lining, stair and mattress pads. Mrs. Carrie Morse, double crib. Pacific Spring and Mattress Co., parlor suits. Haywood Bros. & Co., display of Rattan goods. B. F. Farrar, general display of bed room sets. Pacific Spring and Mattress Co., sofa beds.

CLASS 23—P. Lieseufeld, best billiard balls, cues aud racks.

CLASS 24—Coos Bay Stone and Lumber Co., beer coolers, ice chests and refrigerators. Keystone Wringer Co., wringers and carpet sweepers. Weister & Co., display of house furnishing articles. B. F. Van Amringe, magic window screen. Buchanan Bros., display of brushes, California make.

CLASS 25—Gillispie & Childs, tule iuner soles for shoes. Main & Winchester, horse collar. Kinkler, Schoening & Co., leather for buttonhole lining.

CLASS 26—Californuia Silk Culture and Development Co., display of raw silk. W. R. Gallup, Spanish merino wool. Julius Weyand, specimens of mohair. California Wool Scouring Co., samples of scoured wool. H. Liebes & Co., samples of furs, cleaned or colored. Mrs. J. P. Henderson, ermine trimmings. California State Wool Growers' Association, display of wool. J. H. Glide, Spanish merino wool. Frank Bullard, Spanish merino wool. J. B. Hoyt, Sbropshire and crosses between Sbropshire and Spanish merino wool.

CLASS 28—J. M. Litchfield, military goods, display of regalia.

CLASS 29—Madame Soutenir, feathers, wings and birds.

CLASS 30—The Tecbnical School of Cigar Manufacturers' Association, cigar manufacturing. Mrs. C. Murray, display of Turkish tobacco and Latakia cigars.

CLASS 31—Downing & Son, display of Murray & Lanman's Florida water. H. B. Slaven, display of fruit salt and perfumery. Kalliodont Manufacturing Co., display of dental toilet preparations. California Volcanic Mineral Water Co. (Castilian), best natural medicinal water. Mrs. H. M. Rutberford, engraving fluid. Royal Mustard, Oil and Drug Works, display of mustard and mustard oil.

CLASS 33—H. B. Birnbaum, Cibil's extract of beef. Scott, McKean & Co., agents Moore & Brady, Baltimore, M. D., deep sea oysters. J. Morton, Jr., Parisian sauce. Richards & Harrison, sea-firing apparatus. Castle Bros., breakfast gem. Mrs. L. H. Moise, display of preserved fruits in glass.

CLASS 34—Arpad, Haraszthy & Co., best Reisling wine, 1881, 1882. Same, Zinfandel table claret. Same, best port wine, unusually dry. Same, best Angelica wine. J. H. Drummond, best red wine, Burgundy type, vintage 1881, remarkably fine. Same, France Pinot wine 1883. Same, red wine, 1881, (table claret). Same, best white wine. Same, Sauterne, 1882. Same, Gutedel, 1881. H. Lachman & Co., Gutedel wine, vintage 1880. Same, Madeira, 1876, best wine on exhibition. Same, Muscat, 1876.

CLASS 35—A. Fenkbausen & Co., old Pioneer whiskey. A. Fenkhausen, rum punch. Same, Sweedish bitters. Wm. Goeppert & Son, Bavarian Felsen beer.

CLASS 36—F. A. Labadie, map of the Mexican States. J. C. Merriam, display of maps and atlases. Wm. M. Cubery, display of society cards. J. Clayton, Quaker cook book.

CLASS 37—Nat. Raphael & Co., display of the "Mechanic's watch."

CLASS 38—Cal. Electrical Works, best electric pen. Electrical Supply Co., best electrical turn-table. John Roach, drawing instruments.

CLASS 39—Wm. Beeman, assortment of trusses and bandages. Pac. Electric Co., electric truss.

CLASS 40—Louis Anderson, best woolen mat. Miss Annie Allen, tapestry picture. Miss S. A. Armstrong, embroidered sofa cushion. Mrs. William Lyne, rustic tables. Misses E. and R. Murray, display of natural ferns and grasses. Mrs. Mary Cumming, silk table cover of national flags, embroidery and crazy patcbwork. Miss Gertrude Field, best display amateur wax work. Mrs. P. A. Fish, crazy quilt. Mrs. Johu Fulton, painted table drapery. Jacob Fretsch, best collection of sbell work. Mrs. Emma George, crochet work. Mrs. L. P. Garcin, crochet tidies. Emma Hare, darned net. Mrs. J. P. Henderson, ermine trimming. Miss V. Huppert, wax poud lilies. Mrs. M. B. Henderson, hair work. Fannie Kalisky, embroidered table cover. Mrs. C. W. King, crazy table cover. Miss Maria Langrehn, pictures in embroidery. Clara Leal, aged 9 years, crochet tidy. Mrs. B. Mortensen, spread and bureau pieces. Francisco Martinez, Spanish straw work. Silvia Rattenzi, worsted embroidery, linen embroidery. Mrs. Sol. Runyon, net work. Mrs. H. L. Rosenblum, patchwork. Mrs. H. E. Steerer, afghan. Miss F. Shamp, hand-made lace. Bertha White, 11 years of age, crochet tidy. Mrs. M. Bucelli, crochet work. Mrs. R. Baker, sofa cushion. Mrs. S. A. Brown, crazy quilt and shams. Miss Maggie C. Corr, 30tb and Mission, air castle. Miss Carrie Christie, tapestry picture. Miss Annie Cecil, autumn leaves. Mrs. R. Baker, knitted bed spread. Miss Theresa Corlett, skeleton leaves. Mrs. J. E. Cotter, sea mosses. Emma D. Cork, best specimen of wax work, bouquet wax flowers. Miss Annie Davis, worsted wreath. Mrs. Georgie Davidson, crochet quilt and shams. Mrs. Mary Ebeler, best crochet spread. Mrs. M. Erens, knitted lace, yoke and sleeves.

CLASS 43—James Linforth, samples of white bronze monuments. M. Roth, best statuesque (home production). Richards & Harrison, Japanese art statue. J. K. Newton, meerschaum pipe. Mrs. S. F. Neil, modeled mirror. Miss A. Carter, painting on plush. Richards & Harrison, Japanese art statue.

CLASS 44—A. Hoffmann, steel engraving. Nellie L. Scribner (6 years of age), crayon drawing. Eva E. Scribner (10 years of age), crayon drawing. Carl Eisenschimel, pen drawings. G. B. Bernard, specimen of penmanship and lettering. Miss E. McMahon, map drawing. W. H. Smythe, original mechanical drawing. Pupils of Madam Zeitska's private school, free-hand drawing. E. McD. Johnstone, engravings on coal.

CLASS 45—Ada A. Brewster, pencil drawings. Mrs. M. K. Irving, crayon portrait. Miss Lizzie Smith, colored pbotographs. Mrs. Plummer, enameled pictures on glass. Ada A. Brewster, pencil drawing. Mrs. M. K. Irving, crayon portrait.

CLASS 47—Ira F. White, seedling peaches. Silas McLaughlin, fox cliug peaches. M. A. Walton, peacbes. M. Vulicevich, native and imported fruits. Ira Davenport, native fruit. L. Lazarus, peaches. James Collins, samples of fruit. Immigration Association of California, natural products, display of cereals, display of fruits, fresh and preserved.

CLASS 56—Miss Sadie Baum, floral design, "picture, framed on easel." Mrs. J. Darling, floral bouquet. A. Duhem, display of cut flowers.

Cash Premiums.

CLASS 41—Oil and water colors paintings.—The following exhibitors have been awarded a premium in cash, which will be paid on application to tbe Secretary: Henry Alexander, Sam'l M. Brooks, Norton Bush, Miss S. E. Bender, Mrs. J. E. Brown, Miss Ada Brewster, Miss. E. Bartholemew, W. Behringer, Miss Alice Chittenden, Chas. J. Carlson, Mrs. S. M. Campion, W. A. Coulter, G. Cadanasso, Miss M. E. Casey, Edwin Deaken, C. De La Berry, W. O. Emerson, H. R. Fish, L. Fitzgerald, Felicite Fortier, Mlle. P. Granjeau, A. Goldenson, Thomas Hill, Mrs. W. L. Higgin, Mrs. E. C. Hatch, J. Hecht, T. L. Heath, Mrs. Wm. Ireland, Alfred Jenks, T. Kago, Miss Jessie Kirk, Miss Rosa Lewis. Miss Clara McCbesney, M. H. Moore, E. Narjot, Arthur Nabl, Miss Annie Oesterman, Ada Piatt, Miss Emily Ryder, M. Strauss, S. W. Shaw, Miss Susie Sroufe, Miss Emilie Stallman, F. Shafer, Mrs. R. R. Vansano, Miss Dora Vassault, Mrs. A. E. Wilson, Virgil Williams, Mrs. Dora N. Williams, William Winter, J. B. Wandesforde, Miss A. Williams, Cas. T. Wilson, R. D. Yelland.

Mining Share Market.

The San Francisco Stock and Exchange Board will probably relax its rules, in a manner which shows to what a picayunish state the mining stock business has arrived. A resolution has been introduced which reads that on all stocks under the record value of $1 per share, bids of one cent advance or decline may be made from this time forward. The rule since the inauguration of the board has been that no bid of a less amount than five cents could be made on any stock under a value of $5, and one-eighth on al stocks above that price. The one-cent rule has prevailed for years in all the Eastern exchanges.

The topic of the week on stock circles has been the contest for the control of Chollar. For the past four months a rather ill-tempered struggle has been carried on for the control of certain Comstock mines — the Ophir, Mexican, Chollar and Potosi levels being the principal theater of action, and the Nevada block people and Sharon being the participants. It having been represented to Judge Wilson that a change of officers was necessary, the representations coming from the anti-Sharon stockholders represented by Alvinza Hayward and W. S. Hobart, his partner, the Judge issued an order for a meeting, at which if it were found that a majority of the stockholders so desired, an election of new Directors might be had. The result of this meeting this week was, that the old Board of Directors was removed. These Directors were: A. K. P. Harmon, President; J. D. Fry, William Norris, J. H. Dobinson and C. L. Weller. With the sanie unanimity the prepared list of new Directors was balloted for, and Dr. Dutch, Alvinza Hayward, R. Wilson, A. W. Rose, Jr., W. E. Sell and C. T. Bridge were declared the new Directors. The Sharon faction was therefore defeated, but the matter is not at an end yet.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & CO.'S SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.]

FOR WEEK ENDING SEPTEMBER 9, 1884.

304,909.—WALL SCRAPER—J. E. W. Coleman, S. F.

304,994.—SPECTACLES—A. J. Cross, San Jose, Cal.

304,807.—WRENCH—Benton Elmore, Etna, Cal.

304,811.—CULTIVATOR—M. M. Estee, S. F.

304,829.—METAL SHEARING APPARATUS—R. L. Knapp, Half Moon Bay.

304,947—DEVICE FOR LOADING VESSELS—C. Miller, Seattle, W. T.

304,861.—SULKY CULTIVATOR—W. H. Roberts, Santa Clara.

304,863.—RAILWAY CAR—Henry Root, S. F.

304,968.—DERRICK FORKS—C. Stone, Walnut Creek.

304,767.—WOOL-WASHING MACHINE—H. C. Walker, S. F.

FOR WEEK ENDING SEPTEMBER 16, 1884.

305,268.—BRICK-KILN—Thos. M. Bannister, Lone Pine, Cal.

305,130.—BALANCEO ROTARY VALVE—Hans C. Behr, San Francisco, Cal.

305,131.—BALANCED ROTARY VALVE—Hans C. Behr, San Francisco, Cal.

305,132.—BALANCEO ROTARY VALVE—Hans C. Behr, San Francisco, Cal.

305,133.—ENGINE-VALVE—Hans C. Behr, San Francisco, Cal.

305,134.—BALANCED SLIDE-VALVE—Hans C. Behr, San Francisco, Cal.

305,041.—WINDOW-WASHER—Jacob F. Bentz, San Francisco, Cal.

305,375.—HEAO-REST FOR WATER-CLOSETS—Wm. Cummings, Sacramento, Cal.

305,055.—QUARTZ-CRUSHING MACHINE—C. Dandurand, Virginia City, Nev.

305,379.—BOLT-DRESSER—Henry Eyeberg, Napa, Cal.

305,166.—COLLAR-STUFFING MACHINE—Calvin Ewing, San Francisco, Cal.

305,179.—HORSE-COLLAR—Thos. F. Hagerty, San Francisco, Cal.

305,308.—GAS-MAKING MACHINE—A. and T. Henning, Sacramento, Cal.

305,193.—SIDE-SPRING VEHICLE—Z. M. Howell, Salida, Cal.

305,081.—GRIPPER FOR ENDLESS-CABLE RAILWAYS—W. W. Kendall, San Francisco, Cal.

305,203.—GRAIN-SEPARATOR—A. W. Lockhart, Stockton, Cal.

305,098.—SIGN—G. W. Menefee, San Francisco, Cal.

305,323.—STEAM-ENGINE GOVERNOR—Wm. R. Michener, Benicia, Cal.

305,226.—BUILOING CONSTUCTION—E. L. Ransome, San Francisco, Cal.

305,112.—PRESS-PAD FOR PANTALOONS—S. C. Rugland, San Francisco, Cal.

305,248.—HOISTING-CRANE—A. J. Stevens, Sacramento, Cal.

305,114.—WIND ENGINE—H. K. Stevens, Los Angeles, Cal.

305,250.—JOINT-PROTECTOR AND IGNITER FOR FUSES—E. A. Thompson, Silver City, Idaho.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific coast inventors transacted with perfect security in and the shortest possible time.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faitbfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

Mining Books.

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STOCKHOLDERS' MEETING.

Notice is hereby given that a meeting of the Stockholders of Fremont Mining and Milling Company will be held at the Company's office, No. 402 Front Street, Room 8, San Francisco, California, on Tuesday, October 7, 1884, at 12 o'clock M., for the purpose of electing officers for the Company, and of acting upon a proposed amendment of the By-Laws of the Company, providing that vacancies in the offices of President, Vice-President, and Trustees shall be filled by the Board of Trustees.

MARK T. ASHBY, Secretary.

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San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Sept. 25, 1884

ANTIMONY—Per pound		@	
Hallett's	14	@	—
Cookson's	15	@	—
BORAX—Refined	8½	@	9
IRON—Glengarnock ton	25 00	@	—
Eglinton, ton	24 00	@	—
American Soft, ton	25 50	@	—
Oregon Pig, ton		@	—
Clipper Gap, Nos. 1 to 4	30 00	@	32 50
Clay Lane White	22 50	@	—
Shotts, No. 1	26 00	@	—
Refined Bar	3½	@	3
Boiler, 1 to 4	5 00	@	5 50
Plate, 5 to 10	4½	@	4¾
Nail Rod	7½	@	—
Norway, according to thickness	6½	@	7¾
STEEL—English, lb	16	@	25
Black Diamond, ordinary sizes	14	@	—
Drill	15	@	—
Machinery	12	@	14
COPPER—Ingot	15	@	16
Braziers' sizes	16	@	25
Fire-box sheets	28	@	37
Bolt	23	@	25
Old	12½	@	15
Bar	—	@	—
Cement, 100 fine	12	@	—
Copper in New York, Sept. 25	13¾	@	—
LEAD—Pig	3¾	@	4
Bar	5½	@	—
Pipe	7	@	—
Sheet	8	@	—
Shot, discount 10% on 500 bags: Drop, ₱ bag	2 00	@	—
Buck, ₱ bag	2 20	@	—
Chilled, do	2 40	@	—
TIN PLATES—Charcoal	7 00	@	7 25
Coke	5 75	@	6 75
Pig	19 00	@	20 00
Banca tin	22	@	23
I. C. Charcoal Roofing, 14x20	6 25	@	6 50
ZINC—German	9	@	10
Sheet, 7x3 lt, 7 to 10 lb, less the cask	8	@	9
QUICKSILVER—By the flask	30 00	@	—
Flasks, new	1 05	@	—
Flasks, old	85	@	—

WHAT IS THE DIFFERENCE BETWEEN "PEBBLE" AND "GLASS" IS ASKED EVERY DAY.—"Pebble," which always retains its transparency, is much more highly prized for its greater hardness, and being cooler and possessing greater refractive power, a better conductor of heat than glass. "Glasses" are more or less influenced by the damp state of the atmosphere, become turpid, soil more readily, thereby rendering them more difficult to keep clean, and much more liable to become scratched in use. The nature of the material of which lenses are made can be best ascertained by determining the co-efficiency of light; by placing the lenses between two plates of tourmaline, called pebble test, which neither the flint or crown glass can the light pass through, showing the greater transparency of the pebbles over glass; of course taking for granted that where "rock crystal" is used, if not homogeneous, but of a stratified growth, that the lenses will be cut at right angles to the axis of double refraction, as such lenses would be bi-refringement and split up a ray of light, making them very injurious to the sight and having no advantage over glass, only in cheapness. "Rock crystal" lenses badly cut, either through carelessness or design, in order to cut the largest number of lenses from a given piece of rock, may be found at the Cheap Johns and other venders of spectacles, claiming for them all the good qualities possessed by the justly celebrated Pebble Spectacles, obtained only at C. MULLER'S Optical Depot, 135 Montgomery street, near Bush, opposite the Occidental. 4

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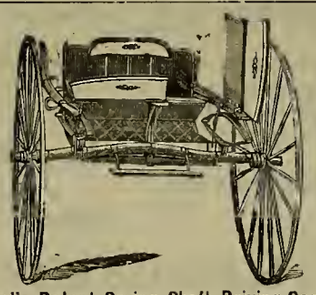

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California Inventors

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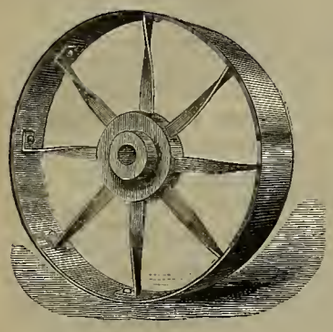

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This COKE is exclusively used by Prof. Thomas Price, in his assay office, by the Selby Smelting and Lead Co., Prescott, Scott & Co., Risdon Iron and Locomotive Works and others in this city. Large supplies are regularly forwarded to consumers in Salt Lake and Nevada, to the Copper Queen Mining Co., Longfellow Copper Mining Co. and other consumers in Arizona.

The undersigned are in receipt of regular supplies from Cardiff, Wales, and offer the COKE for sale in quantities to suit purchasers.

BALFOUR, GUTHRIE & CO.,
316 California St., San Francisco.

THE DUNCAN CONCENTRATOR

BEYOND QUESTION THE
Cheapest and Most Effective Machine
OF THE KIND NOW IN USE.
Adapted to All Grades and Classes of Ores

This machine has been thoroughly tested for the past two years under a great variety of conditions giving most extraordinary results, far in advance of anything ever before realized.

A recent competitive test made with the Frue at the Carlisle mine, in New Mexico, showed an advantage of 30 per cent in favor of the Duncan. The amount saved over the Frue being sufficient to pay the entire cost of the machines nearly every month of the year. The following is an enumeration of its many advantages over all other similar machines:

1. Its cost is not more than half that of any other of equal capacity, and the weight is nearly 1,000 pounds less, thus greatly reducing the cost of transportation.
2. The expense of setting up in running order is not more than one-third that of the Frue, or any other belt machine, much less grading and timber work being necessary.
3. The expenditure for repair is not more than one-fifth that of any belt machine, and they will last fully three times as long, working under the same conditions.
4. Not more than one-half the space is required—a point of great importance where a considerable number are used.
5. No special skill and very little care is necessary to operate it.
6. No more water is required than is furnished by the batteries.
7. It saves all the amalgam, gold or silver, that escapes the batteries, pans or settlers—AN INVALUABLE FEATURE, and claimed by no other, making the machine worth more than it costs for this purpose alone.
8. A much coaser grade of ore can be handled successfully than by any other machine—a great advantage in many instances where fine crushing is not necessary to eliminate the mineral.
9. It has no small and delicate mechanism, requiring nice adjustment and the closest attention—an insuperable objection to all belt and other forms of machines, making them wholly unfit for the rough service of a quartz mill.
10. Great simplicity of construction and small number of wearing parts. The whole machine is comprised in 17 pieces, only 3 of which are subject to any especial wear, and these can be replaced at a nominal cost. The Frue has 113 pieces, and some similar machines many more, making a complication of parts that involves constant repair and great expense in this way, as well as in loss of time.

We are aware that the most sweeping and pretentious claims are made for nearly every concentrator in the market, but it is a well-known fact that the results of their operation have not in any instance made good these claims. The advantages here set forth for the Duncan, as well as the statements made, we are prepared to substantiate by actual working results. **Price, $350. Weight, about 1,750 pounds.**

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NEW ERA DUPLEX STEAM PUMP
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THIS PUMP HAS TWO DOUBLE-ACTING PLUNGERS.
Never Sticks. Always Ready to Start.
No Auxiliary Valves to get out of order.
No Noise. Can be run Fast or Slow.

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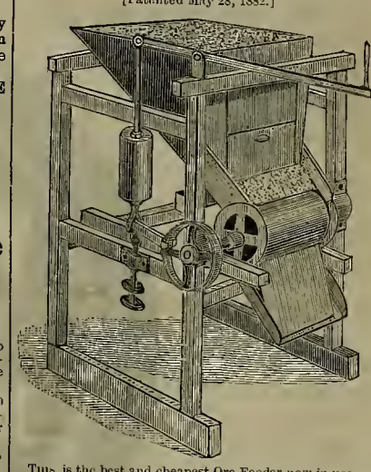
A Great Triumph!
WON BY THE MANUFACTURERS OF THE
EUREKA CEMENT,
GOULD & HILL, Proprietors,
103 and 105 Fremont St., San Francisco.

On the 25th day of August, 1884, Judge Sabin, of the United States Court of Equity, decided the great infringement case of the Salamanda Felting Company of New York and Philadelphia vs. the EUREKA CEMENT, in favor of the EUREKA CEMENT. This decision is one of the most important that has been rendered for many years, because it gives Messrs. GOULD & HILL the unrestrained right to continue the manufacture of the BEST COVERING FOR STEAM BOILERS AND PIPES that is known to the world.

THE ROLLER ORE FEEDER
[Patented May 28, 1882.]



This is the best and cheapest Ore Feeder now in use.

It has fewer parts, requires less power, is simpler in adjustment than any other. Feeds coarse ore or soft clay alike uniformly, under one or all the stamps in a battery, as required.

In the Bunker Hill Mill it has run continuously for two years, never having been out of order or costing a dollar for repairs.

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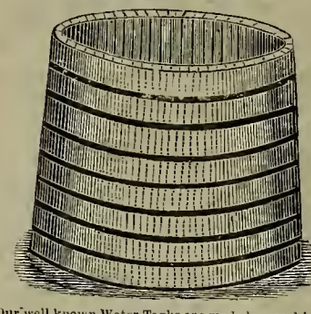

Our well-known Water Tanks are made by machinery, from the best of materials, and shipped to all parts of the country. Each piece numbered. No skill required in setting up.

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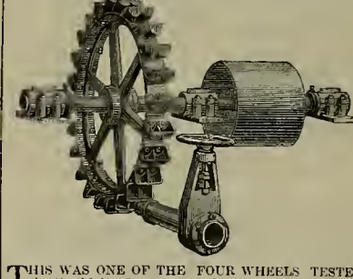

THIS WAS ONE OF THE FOUR WHEELS TESTED by the Idaho Company at Grass Valley, Cal., and gave 90 2 per cent., distancing all competitors. Send for Circulars and guaranteed estimates.

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SILVER PLATED
AMALGAMATING PLATES
FOR SAVING GOLD.
Used in Quartz, Gravel and Placer Mining
In any Size or Quantity Furnished to Order.

The BEST PROCESS yet discovered for saving fine Gold. Gold, Silver, Nickel and Copper plating on all metals. Old Tableware repaired and replated.

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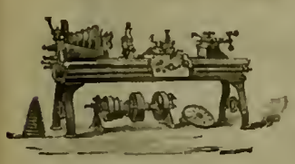
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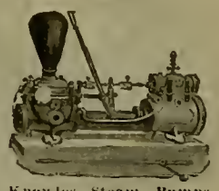
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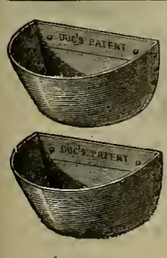

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Always First Premium in Competitive Trials.

Extra Strong and Very Durable.

Made of Best Charcoal Iron. Only One Seam. No Corners to Catch. Runs with Least Power.

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Car and Locomotive Axles and Frames, and Hammered Iron of Every Description.

HIGHEST PRICE PAID FOR SCRAP IRON

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Stationary and Compound Engines, Flour, Sugar, Quartz and Saw Mills. Amalgamating Machines.

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PUMPS ☞ IRRIGATING ☜ PUMPS

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200 to 10,000 Gallons a Minute.

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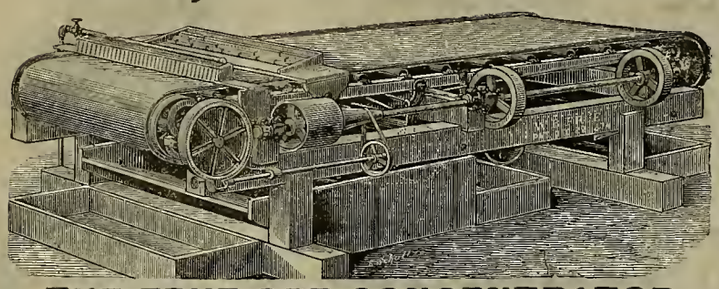
$1,000 CHALLENGE!



THE FRUE ORE CONCENTRATOR,
OR VANNING MACHINE.

PRICE: FIVE HUNDRED AND SEVENTY-FIVE DOLLARS, ($575 00), F. O. B.

OVER 1,000 ARE NOW IN USE. Saves from 40 to 100 per cent more than any other Concentrator. Concentrations are clean from the first working. The wear and tear are merely nominal. A machine can be seen in working order and ready to make tests at the Fulton Iron Works, No. 220 Fremont Street, San Francisco.

As the result of a suit East against an End-Shake Machine (the Embrey), similar to the Triumph, the Frue Vanning Machine Company owns the Embrey patent, and can put in the market an End-Shake Machine of earlier patent that will do as good work as the Triumph, and superior in construction and durability. There will be no risk of suit for infringement.

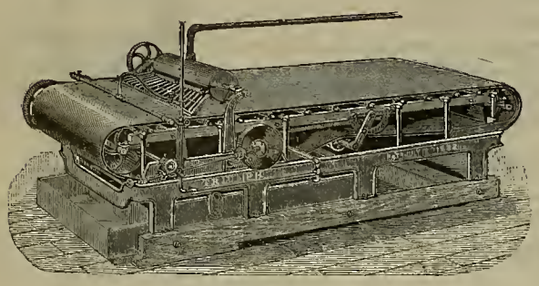
The Frue Vanning Machine Company warn the public that they claim and will prove the Triumph machine to be an infringement on patents owned by them.

Protected by patents May 4, 1869, Dec. 22, 1874, Sept. 2, 1879, April 27, 1880, March 22, 1881, Feb. 20, 1883, Sept. 18, 1883. Patents applied for.

N. B.—We are and have been ready at any time to make a competitive trial against the Triumph, or any other Concentrator for stakes of $1,000.

ADAMS & CARTER, Agents Frue Vanning Machine Co.,
Room 7—No. 109 California Street, - - - SAN FRANCISCO, CAL.

$1,000 CHALLENGE ACCEPTED!



THE
"TRIUMPH" ORE CONCENTRATOR.

PRICE, FIVE HUNDRED AND FIFTY DOLLARS ($550.00), F. O. B.

THE "TRIUMPH" TRIUMPHANT!

In a competitive trial recently had between two of the "Triumph" Ore Concentrators and the same number of "Frue" Vanning Machines, at the mill of the celebrated gold producing Original Empire Mill and Mining Company, in Grass Valley, Nevada County, Cal., the "Triumphs" produced thirteen and fifteen one-hundredths (13.15) per cent more concentrations than did the "Frue" Vanners, during a run of twenty-four consecutive days, or a net gold coin result of $109.15, or $8.30 per day, in favor of the two "Triumph" Concentrators.

These returns do not include the value of the amalgam saved by the "Triumphs" during the test; which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarily saved, which is lost on the "Frue" Vanners.

This trial was conducted under the personal supervision of the Manager and Superintendent of that Company, in a strictly fair and impartial manner, and with the sole view of determining, in the interest of that Company, the merits and demerits of the respective machines by a thoroughly practical test. A relation of the course of procedure, a concise analysis of assays, and a tabulated statement of the net bullion results, with accurate deductions therefrom, will soon be published in Circular form.

The superiority of the present construction of the "Triumph" over the form originally introduced, together with the demonstrated results of the above, and other trials had with the "Frue" Vanners, induce us to and we hereby accept the Challenge of $1,000, flaunted by the Agents of the "Frue Vanning Machine Company," and hold ourselves in readiness to enter into a second competitive trial for that sum, at such place and upon such terms and conditions as may hereafter be mutually arranged.

We guarantee purchasers against all costs, expenses or charges incurred by reason of any infringements of any existing patents.

"Put up or shut up," and "Let the Best Machine win!"

JOSHUA HENDY MACHINE WORKS,
Nos. 39 to 51 Fremont St., San Francisco, Cal.

JOSHUA HENDY MACHINE WORKS,

Incorporated September 29, 1882.

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OF EVERY VARIETY.

Steam Pumps of all Makes,
CENTRIFUGAL PUMPS,
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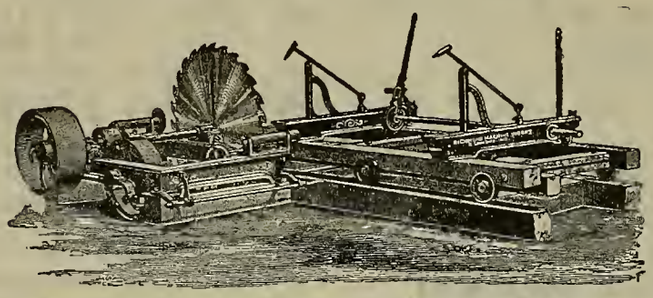
BLOWERS AND EXHAUST FANS.

LEATHER AND RUBBER
BELTING.



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SHINGLE MILLS.

WOODWORKING MACHINERY,
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Band Saws,
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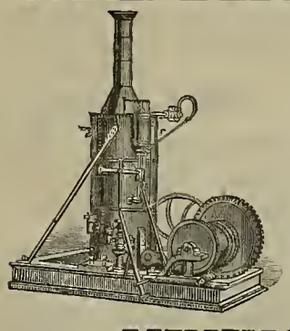
Planers,
Shapers,
Etc., Etc.



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...AND...
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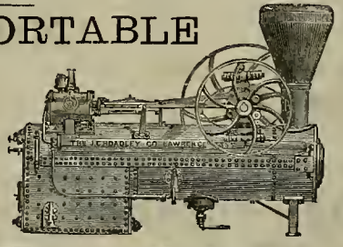
.....AND.....
BOILERS.



MINING, QUARTZ, AND SAWMILL MACHINERY.

AUTOMATIC ORE-FEEDERS, HENDY AND TRIUMPH CONCENTRATORS.

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Baker Rotary Pressure Blowers, Akron (Ohio) Hot-Polished Shafting,
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

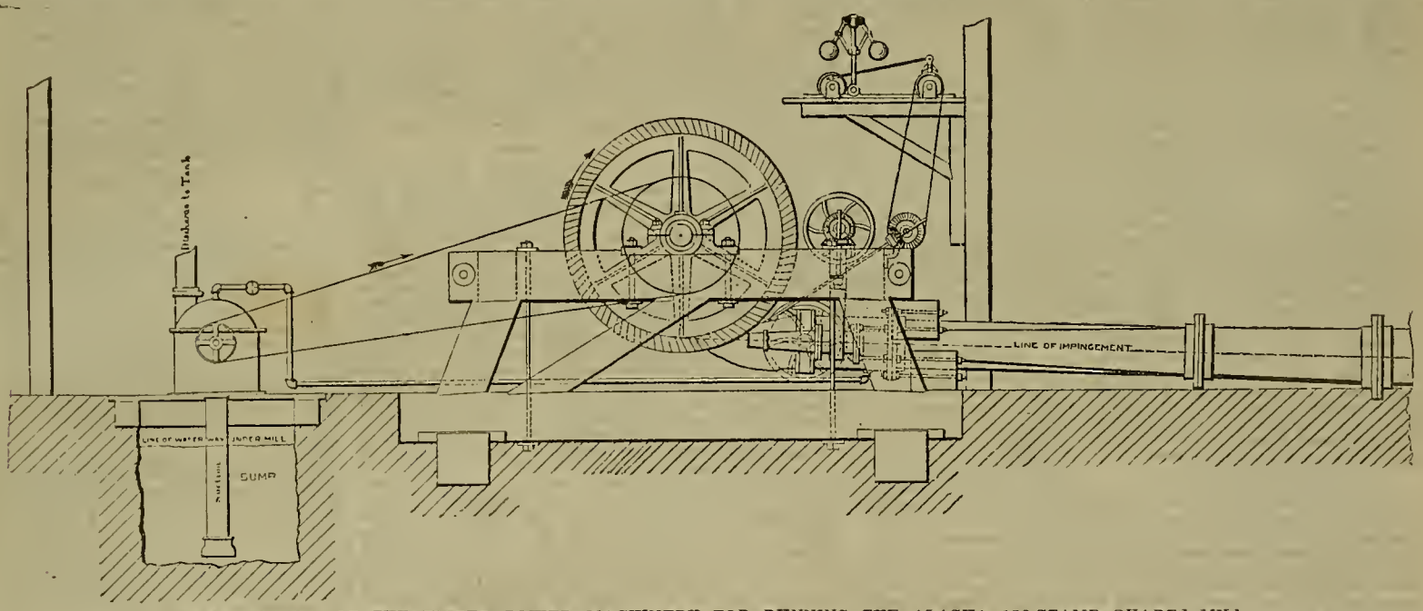
SAN FRANCISCO, SATURDAY, OCTOBER 4, 1884.

VOLUME XLIX. Number 14.

Water-Power Machinery for the Alaska Mill.

In the last number of the MINING AND SCIENTIFIC PRESS we gave a description, with illustration, of the new 120-stamp mill of the Alaska Mill and Mining Co., now being erected at their mine on Douglas island, Alaska. It was stated in that article that we should give some details concerning the motive power of the machinery, water being used instead of steam. On this page we give an engraving representing an elevation of the water-power portion of the plant, and on page 213 is a plan view of the same.

The Alaska M. & M. Co.'s plant consists of a 120-stamp mill, with 48 Frue concentrators, all necessary feeders and breakers, electric light machinery and machine shop, together with pump for supplying battery water. This machinery is to be driven by not less than 250 miners' inches of water under a head of 380 feet, which comes from a ditch about 1,500 feet from the mill, and is conducted thereto by means of, first, a 22-inch pipe, and then an 18-inch pipe, leading to the water-wheels. The management, desiring to have a reserve power in case of accident, decided to put in both a Knight wheel and a Pelton wheel, each six feet in diameter, upon the same shaft, and either of these wheels will develop the necessary power at a moment's notice. It is the intention to run but one wheel at a time, holding the other for reserve, and during the low stage of water the one will be used that takes the least water. Inasmuch as these wheels are keyed to the same shaft, and under precisely similar conditions, no fairer test of the relative economy of these wheels can be made. The shaft is six inches diameter and held by three boxes, 16 inch bearing and 500 lbs. weight each, thus insuring steady running. The wheels make 236 revolutions per minute, and the power is transmitted by means of sixteen two-inch ropes running on four-rope sheaves, keyed to the same shaft as the wheels. The battery water is raised 28 feet from the wheel pump by means of a balanced turbine pump capable of delivering 1,600 gallons per minute, this pump being driven directly from the main shaft, as shown by the 8-inch belt. It being of the utmost importance to maintain a uniform speed to the shafting throughout the mill, a governor has been placed on the Knight wheel, as shown, and it operates by contracting the nozzle, forcing the water to escape through a small opening, but not injuring the pressure, as the water is not throttled in the least degree. The nozzle of the Pelton wheel being round, renders present methods inadequate to supply a proper governor, and it was omitted. Either of these wheels will develop with ease not less than 250 horse-power, and as much more if required. Every attention has been given to make this plant the most perfect of any on the coast. The whole of this portion of the outfit was designed and built by Edward A. Rix & Co., 18 and 21 Fremont street, San Francisco, who make a specialty of such water-power appliances.



ARRANGEMENT OF THE WATER POWER MACHINERY FOR RUNNING THE ALASKA 120-STAMP QUARTZ MILL.

Electric Blasting.

In preparing an artificial lake or reservoir to add to the water supply of Liverpool, a large stone dam is being built, some 70 miles from the city, and the quarrying operations in obtaining the stone for the dam are quite extensive. The quarries are lighted by electricity, and the fluid is also used in blasting operations.

The beds of rock lie in a way which peculiarly adapts itself to electric blasting, and this has been adopted to the almost total exclusion of the ordinary methods by means of a fuse, which is only used in isolated and special cases. At first the Welsh quarrymen and foremen were much prejudiced against its employment, and used every means to discourage its introduction. The engineer has succeeded, however, in carrying his point, and a man and a boy have now been trained, and are almost constantly employed in preparing the fuses and firing the shots. The battery employed for firing is one of Siemen's high tension, and resembles when open a small dynamo, being driven by a handle and train of wheels, and to which is attached a condenser, consisting of alternate layers of mica and tinfoil. The electricity stored in the condenser is automatically discharged at every third turn of the handle of the machine, and passing along the wires and through the fuses, fires the holes simultaneously. As many as 50 holes can be fired at once, but in practice it was not found advisable to couple more than 30 together, owing to the difficulty of isolating so many, and the consequent short-circuiting of some of the holes, thus spoiling the blast and necessitating their subsequent firing. The holes as a rule are nine feet deep, one and one fourth inches diameter, three feet apart, and placed at a distance of nine feet from the edge of the rock. The men stand on a line of planks along the slope when preparing holes for a blast. Thirty of these holes would bring down a mass of 576 tons of rock, in blocks from three to five and ten tons, those from three to seven tons being the most useful, as if they were over seven tons the cranes used in building are unable to lift them. A great deal of waste is occasioned by breaking up large stones, as one of eight tons cannot be broken into two good stones of four tons, and sometimes the effort to do so is simply wasted. In order to prevent, as far as possible this waste, owing to the blocks being too large, much judgment and experience are necessary in choosing the best site for the holes, and after many trials the above dimensions were adopted as affording the best average results.

MANUEL EYRE, a stockholder in the Day Silver Mining Company, has sued Geo. W. Beaver, Thomas Cole, J. D. Browne, A. K. Grim and Henry A. Fox, Directors of the Company, charging them with neglect of duty, in failing to make reports required by law; that by such failure and neglect the defendants became liable to plaintiff in the sum of $1,000, for which sum and costs of suit, he brings suit.

THE business portion of Rathdrum, Idaho, near the Cœur d'Alene mine, was destroyed by fire on the 28th inst.

Shipping Copper Ores.

Although Great Britain is the great copper market of the world, she is by no means a great copper producer from her own resources. The mines of that country formerly produced much more than at present, but their product has steadily declined under the heavy receipt of ores, furnace products, precipitate and bars from other countries. She now produces about 50,000 tons of ore a year, yielding between 3,000 and 4,000 tons of copper, mainly from Cornwall. The influence of Great Britain as the leading copper market of the world is due to the enormous quantities of crude metal, furnace products and ores it handles, which go there from all over the world. The great metallurgical, chemical and manufacturing industries place it in a position to work black copper, regulus, mattes, and ores for fine metals, and re-distribute a large portion of it in the shape of manufactured copper, cheaper than the countries in which the raw material originates and to which part of it returns.

The material which comes there from Chili, Canada, Australia and Cape of Good Hope is chiefly regulus. The ores are shipped from many quarters—Italy, Venezuela, Chili, Bolivia, Cape of Good Hope, British North America and the United States. In 1882 she received 103,263 tons of ore, valued at over one million pounds, and averaging about 15 per cent. This was ore alone. The lowest grades of ores come from Canada, while Italy and Venezuela supply a medium grade. It is thought the Cape mines cannot maintain the high grade of their ores much longer. Cuba no longer ships any, and Australia smelts at home and ships chiefly refined copper. The black and refined copper go from Chili and Australia. Montana ships high grade ore. British India is the best purchaser of English copper and its manufactures, while France takes the greatest quantity of crude metal, followed closely by Germany.

THE tramps scattered over the Territories are coming to California to winter.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents. — EDS.

Butte City, Montana.

A General View of Montana Territory, and a Glance at the Resources of Butte City.

Looking at the map of the great Northwest, and centering attention upon the Territory of Montana, one wonders at the probable future of that mountain-ribbed, vast-plained commonwealth. The western spur of the Rocky mountains, at its summit-line, is the boundary between this Territory and Idaho on the west and southwest, while for nearly 500 miles it touches Wyoming on the south. Twelve degrees of longitude, or 830 miles, are embraced within its northern boundary on British America, and nearly four degrees, or 270 miles, within its eastern boundary on Dakota Territory. Its area in acres is stated to be 90,000,000, of which 25,000,000 are arable, and many more millions are capable of sustaining vast herds of stock. Surely these are magnificent figures, and increase one's desire to analyze with some closeness the resources of this inland empire, to ascertain whether the enumerations are mere idle calculations of superficial areas, or the portents of a division within our galaxy of States rich in all that goes to make up a prosperous and happy people.

Early Explorers

and even travelers or residents of the present generation, tell us of the immense herds of buffalo and elk that peopled the plains of central and northern Montana. The slaughters by hunters and the advance of civilization have caused these to be succeeded by other vast herds of cattle and sheep, which here find free pasturage upon the luxuriant bunch grass that is so abundant; and now cattle kings of great wealth are coming to be one of the features of the Territory. The plains spoken of are cut and crossed by mountain spurs, and are watered by great or small rivers, so that there are well-defined regions, with distinct names, which make the local geography of the Territory a veritable Chinese puzzle to the transient visitor or the new-comer. Many of the river valleys have bottom-lands of great fertility, where ample crops of cereals may be or are raised, the fact of their cultivation depending entirely upon the local market. Where adjacent mining camps make a market secure, there we find agriculture flourishes; where this is not the case, these tillable lands are allowed to lie idle, or are availed for pasturage, until a home market shall be created. For Montana can hardly hope to compete with the grain fields of States and Territories nearer to the centers of population or to shipping ports for the foreign world. Transportation is too expensive as yet for that condition of things. Thus, in a general view, we have in Montana a Territory which, as to agriculture, will ever keep pace with its own development in other directions, and in this respect it may be counted an independent and self-supporting region.

The Timber Resources

of Montana are also vast. Their computation is a study for the statistician. One authority places the area of timbered lands at 40,000 square miles. From personal observation, we know that much of this area is as densely covered with trees as seems possible. The timbered region is on the western divide of the main range of Rocky mountains; the eastern divide is untimbered, except in strips along many of the water courses. Although vast quantities of lumber have been used in the mines and smelting furnaces and cities of the Territory, and by the railroad companies, the resources in this direction are practically untouched, and it is a mooted question now, if the growth of young pines in the places charred by fire or by cutting is not equal to the present consumption in parent forests. Figures in this line are idle, except to practical lumbermen, so it is sufficient to say that the work of wood-cutting and sawing gives employment to many of Montana's population, and it is an industry that will endure for generations to come.

Thus, in the two resources touched upon, we have elicited facts which may well challenge the attention of our whole country. But we have yet to mention the prime factor in the late growth and prosperity of this one of our several great Territories. The mineral resources of Montana are what create wonderment in the minds of all seekers for information; it is as a mineral-producing Territory that she is coming chiefly to be known. In this line, as well as in that of agriculture, we must deal with the different districts or communities separately, if we would be thoroughly informed, as the discussion cannot be done in a few paragraphs, nor in the form of generalities. Especially is this the case when we look at Montana's development in the line of a mineral producer. We write from Butte City, the mineral metropolis of the Territory, if not of the Pacific coast, and shall, as opportunity offers, speak of other localities as we proceed in our travels.

Butte City.

Butte City is the county seat of Silver Bow county, in the southwestern portion of the Territory. It lies so surrounded with hills and mountains, in a mountainous region, that its connection by rail with other parts of the country has been slow, and has only been consummated within the last year or so. This is one reason why the natural mineral resources of the locality have not before this been developed to their present extent, as Butte has been known as a region of great promise since 1864, when the first settlement was made, some seven miles from the present site of the city. But at that time these were placer diggings and the mining in that direction reached its hight in 1867, after which there was a lull in the mineral development of the region, until the quartz rock began to be worked, and the camp was started on a growth which has ever since been maintained. At present, railroad communication with the outer world is given by a short branch line of the Utah and Northern R. R., from Silver Bow junction, from which point one may go to Garrison, on the Northern Pacific R. R., or to Ogden, on the Union Pacific R. R. The U. and N. R. R. is a branch or feeder to the Union Pacific, and a very important feeder it is getting to be. Butte lies on the southern slope of a considerable hill, and overlooks Summit valley, through which flows Silver Bow creek. This mining district is known as the Summit valley district. The elevation of Butte above sea-level is about 6,000 feet, so that it has a decidedly mountain climate, and lies, as one realizes at times, in the region of the clouds. Its present population is from 10,000 to 12,000, made up largely of workers about mines, business men and their families, and the usual floating population that gathers into a flourishing mining camp. It seems to be a well governed, orderly city, but there are apparent some of the customary vices that are countenanced in cities of this character. Still, in a two weeks' visit, one might easily see more ruffianism in any of our great cities than will be seen here within the same time. In the matter of business, there is a steady and lucrative trade for most of the mercantile houses. It is said that the pay rolls of the mines aggregate $600,000 per month, which goes mainly to some 3,000 miners, wood-choppers and teamsters. The circulation of this amount of money stimulates legitimate trade, as well as some occupations that are not so legitimate. We believe that the extent of business done in Butte is not generally fully appreciated outside the Territory, or by those who have not visited the city. The place has grown to its present dimensions without any flurry or boom, and the methods of conducting mining enterprises are entirely in harmony with this quiet method. Mining here is a business, not speculation. The mines are not run upon the assessments taken from the pockets of distant stockholders—assessments are contrary to the statutes of the Territory. False coloring is not given to reported discoveries in the mines, but these discoveries or workings are mostly kept within the confines of the business offices of the properties concerned. So all is calm, and business-like and in the main solid.

The First Discovery

Of mineral-bearing quartz was made within the present site of the city, and subsequent discoveries and developments have not been extended beyond a circuit of more than a mile or so from this original location. The number of locations made within this small radius is astonishing, and no further progress in the mines need be made to decide that the entire region is thickly ribbed with veins of metal-bearing rock. The number of locations exceeds 4,000, while the locations patented reach fully 1,500. The most profitable of these locations are on what seem to be four main parallel ledges, which run east and west across the district, and are some 1,000 feet apart. Many assert that this idea of four such ledges existing continuously is somewhat theoretical; but certain it is that the larger works of the camp lie on such parallel lines, and it is thought that, in the future, underground connection may be had from mine to mine along these ledges, the same as such connection is now had along the Comstock lode in Nevada. Taking up first the northern of these lines of works, we have the Moulton, the Alice, the Fraction, the Magna Charta, the Valdimere and the Poser. Next, about 1,000 feet, is the line made up of the Lexington, the Allie Brown, the Josephine, the Burnet, the Mountain, the Bell, and others. Still farther south is the great copper belt, on which are situated the Original Butte, Gagnon, Parrot, Anaconda, St. Lawrence, Mountain View, and probably the Colusa, Liquidator, etc. The fourth, or southern system, forms what is called the Black Cliff lode, of vast extent, but as yet not so fully developed as the others. Running almost parallel with these four lode systems are hundreds of claims of less extent, but, as a rule, of considerable richness, as far as they have been explored.

Considerable foreign capital has come in to assist the development of the mines at Butte. Of 13 of the leading companies operating here, 5 have their head offices in the East or in Europe, while in the case of the 7 having headquarters at Butte, Eastern capital has a large influence. But the mammoth enterprise of all—the Anaconda—is controlled by San Francisco capital and enterprise, and has its head office there.

The limits of this article preclude a consideration in detail of the various qualities of ore taken out of the different mines and the method of their treatment, that being a subject warranting special and separate consideration. We here shall limit ourselves to a more or less detailed statement of the condition of the leading properties of the camp, with some statistics gleaned by personal solicitation or borrowed from authentic sources.

The Anaconda.

This mine lies high up on the hill to the northeast of town. The property includes the St. Lawrence mine, which joins the Anaconda on the east. It also includes mammoth concentrating and smelting works at the town of Anaconda, some 20 miles away, to which point the ore is to be carried by cars, to the extent of 500 tons or more per day. Heretofore the high-grade ore of these two mines has been shipped to Swansea, or some point in Europe, for treatment. Some of it holds as large a percentage of copper as a great deal of the matte produced from other ores. What will be done with this ore in the future will be determined when the new reduction works are in operation. An immense quantity of second-grade ore—such as may be successfully operated upon at the new concentrating works—has been accumulating at the ore dumps of the Anaconda during the past two years, and that may be the rock which the new works will handle, while the high-grade ore may still go abroad. Perhaps the managers of the mine cannot themselves now say what will be the future program. The steam hoisting works of the Anaconda and St. Lawrence are probably as massive as any in the world. Although constructed at different points, they are almost twin machines. The former was made in Philadelphia, and the latter by Prescott, Scott & Co., of San Francisco. The chief owner of the Anaconda property is J. B. Haggin, of the same city. The general superintendent of mines is Marcus Daly, a practical miner who came to Butte from Nevada some years ago, arriving in town with a pack mule, and with a much smaller amount of coin than would take a jack to pack it. But by a series of subsequent operations he showed himself such a thorough master of affairs and skillful miner that he came to be placed at the practical head of this mammoth property. The purchasing agent, Mr. Prouse, and the mining foreman, Mr. Carroll, are men of a similar stamp. The depth of the Anaconda shaft is about 800 feet; that of the St. Lawrence, 600. The output of ore from the two mines can vary from 500 to 1,000 tons per day, depending on the requirements of the new works or the demand for shipment. The concentrator and smelter now being built will handle 500 tons of ore per day, being the largest works of the kind known.

The Parrot.

This mine lies just west of the Anaconda. The depth of the shaft is 350 feet, and the amount of ore daily taken out varies from 100 to 150 tons. The Parrot property includes the most complete and extensive concentrating and smelting works yet in operation in Montana. Alongside of these works another system of works, upon a principle new to the camp, is being constructed by the Butte Copper Company, which is an offshoot from the Parrot Company, and which will handle the Parrot ores. The combined works when finished will handle from 300 to 350 tons of ore per day, the capacity of the present works being 100 tons. What the new works will accomplish in the way of producing pure metal from the present ores it is as yet premature to say. They will include a large blast furnace, part of the machinery for which is already in place. The result of the present venture is watched with keen interest, and the PRESS will publish results at the earliest possible date. The skillful metallurgist of the Parrot is Dr. E. D. Peters, an old-time friend and correspondent of this paper, who is now engaged upon a work concerning the mines and mills of Butte for the forthcoming U. S. Geological Report. He has promised some future letters to the PRESS. The general superintendent of mine and smelting works is Mr. J. E. Gaylord, a gentleman of ability in administrative affairs about mines.

The Colusa.

This mine is included in the property of the Montana Copper Company, which embraces also an extensive smelter. The two are close together, and lie on the east side of the Anaconda hill, in what is known as Meaderville, a suburb of Butte. The mine is extensively opened out, with a depth in the main shaft of 560 feet. The value of the matte shipped from the smelter will aggregate some $2,000,000 per year, which shows its ore to be rich in copper. The matte is sent mostly to Europe, though it is apt to go where there is the best market for it. Mr. Mueller is superintendent of works, and the foreman of the mine is Mr. W. H. Pickering, a miner and overseer of experience and skill. Two hundred and sixty men are employed about mine and smelter, and 150 tons of ore per day are handled.

Clark's Colusa.

It adjoins the Colusa on the west. A large concentrator is now in process of erection for handling the ores of Mr. Clark's mines, which will have a capacity of 60 tons per day. W. A. Clark, Esq., the owner of these properties, is one of the leading business men of Butte, and his enterprise in establishing the new works, and thus adding to the productiveness of the camp, is much to be commended. The concentrating apparatus will be from the Fort Scott Machine Works, and they are being put in shape by Mr. H. Kemper, supervising machinist, who has put up three similar works before—one at Corbin, near Wickes, and at Glendale, in Montana, and one in Virginia City, Nevada. He evidently knows how to start such a system of works into operation.

The Lexington.

This property lies to the north of Butte City proper, in Walkerville, another suburb of Butte. This mine, and the Alice and the Moulton lie in close proximity, and make the hill resound with the noise of stamp and hoist. Like the other properties mentioned, mine and mill are combined. In this case the ores are treated by the chlorination process so familiar in California and Nevada camps. French capitalists are the chief owners of the Lexington. Their superintendent and metallurgist is Mr. Alfred Wartenweiler, who has had much experience with the ores of Butte, and who knows how to treat them with thoroughness. In 1881 the Lexington was sold to the present company by Mr. A. J. Davis, still of Butte, for $1,000,000 and a certain percentage of the stock. The present capital stock is $4,000,000. The annual product from mine and mill amounts to some $1,200,000. The Lexington is a magnificent property, its machinery being the best that was obtainable at the time of construction of works.

The Alice

Lies to the north of the Lexington. It is a mine which has been watched with interest for several years, because it was one of the first to reach a considerable depth, and to strike the water level. It now has a 60-stamp mill, besides an older mill of 20 stamps. It is one of the most productive properties in Butte. The depth of its shaft is 700 feet, with a winze to an additional 100 feet. It is well opened out on the various levels. It is one of the few mines of this locality, or the only one, whose stock is on the New York market. The annual product of the mine reaches about $1,000,000. At present most of the ore being operated upon is taken from the Magna Charta, which with the Valdimere (not at present worked) is a part of the Alice property.

The Moulton

Lies close to the Alice, joining it on the west. Mine and mill are joined by a tramway. The mill contains 40 stamps, with roasting furnaces, chlorination works and everything complete for hauling 40 tons of ore per day. The shaft in this mine is down to a depth of 500 feet. Considerable water is handled, the largest pump in the camp being operated here, but the water does not embarrass work. The Moulton is a steadily productive property, but its ore requires economical and thorough management at every step of progress, such as the superintendent, J. H. Clark, Esq., and the forsman, Mr. Patrick Clark, seem eminently fitted to enforce.

The Bell.

The Bell mine lies in the series with the Lexington, but well to the east of that mine. Its smelter is located in the valley below town, some three miles from the mine. Some of the most beautiful specimens of rock carrying native silver that we have ever seen, are to be found in the various cabinets of Butte, labeled, "From the Bell mines." We have seen samples where the dark face of the quartz was spangled as thickly as the stars stud the heavens at night. But the Bell is a mine that has seen its ups and downs. Although for a time closed down last year, it is now a productive property, doing steady work.

Thus far we have enumerated only the larger properties in Butte, which have mines conjoined with mills or concentrating and smelting works. They include the bulk of the mining property in the Summit valley district, and produce, probably, four-fifths of the ore and matte and metal that are annually treated or shipped. But there are other properties that deserve mention, some of which are quite as productive in results as a few of those already described.

The Colorado Smelter.

It lies about a mile south of the city. It employs a large number of workmen, and ships matte and metal to the value of $1,000,000 or so per year. Although it has mines of its own, it sometimes does custom work, and is, therefore, a great stimulant to the development of more modest properties than those which we have before described.

Silver Bow Mill.

This mill is located east of town, just under the brow of the Anaconda hill. It has mining properties of its own, and at present is treating ore from the La Plata and the Stevens; but it usually does some custom work during the year. It contains 20 stamps, with large roasting furnaces, and handles about 30 tons of ore per day. It will probably produce for its owners and customers half a million dollars during the year. J. A. Talbot, a man of great experience, is president and acting superintendent, and his assistant is Mr. E. J. Middleswart, who extended courtesies to our agent during his visit.

The Dexter Mill.

This is one of the older mills of Butte. It runs 15 stamps, but has no roasting furnace. It has been a custom mill for many years, and is now operated as such by several gentlemen who have it leased of W. A. Clark, Esq., whose property it is. We have heard none but good reports from the Dexter mill under its present management. Probably $200,000 as the result of the present year's work is a low estimate for the mill.

The Old Lexington Mill.

Within a stone's throw of Main street, is the oldest piece of mill property in Butte. It runs

(*Concluded on page 214*).

MECHANICAL PROGRESS.

History and Progress of Gun Making.

The manufacturing of gun metal and making it into gun barrels may be classed as one of the fine arts.

If a thorough and reliable metal is wanted for purposes independent of gun barrels, how often we hear of gun metal being used.

The past fifteen years has witnessed great changes and wonderful improvements in the manufacture of gun metal.

At one time English gun makers depended entirely upon the supply of scraps of fine iron and mild steel, such as horseshoe nails, old coach springs, clippings of saws, steel pin scraps, scraps great and small, of all kinds.

The pieces were carefully sorted and placed in a cylinder revolving slowly which polished and cleaned them by attrition one against the other.

They were then cut in small pieces of uniform size and placed in the furnace until at a white heat, then gathered in a bloom, after which, being placed under the hammer, were welded into a rough cube of iron.

This cube was rolled into bars, cut into lengths, and the number of lengths required bundled together and again brought to a white heat, then hammered into rods of 5-16 inch square, or smaller or larger as demanded by the barrel-welder for the work in hand.

At one time fine Damascus barrels were made almost entirely from old coach springs. It was found this would make very strong and fine barrels and showed a great freedom from "grays" (gray specks that disfigured the barrels, but did not impair their strength). It was thought the peculiar wear the fine metal in the coach springs had been subject to had a tendency to peculiarly fit it for gun-barrel metal.

Be this as it may, there were certainly fine tubes made from coach spring metal.

As the years rolled on the demand exceeded the supply, until at last gun metal had to be made from pig metal of the very best ores.

So far reference has been made only to the metal that goes into the make-up of fine Damascus and laminated barrels.

Cheap Guns and Fine Guns.

Inferior metal-scraps of all kinds are used for making the barrels of the cheap guns. This metal is graded and named "shamdam," "scelp," and "charcoal iron." Shamdam is the poorest; from it the cheap twist barrels are made. From scelp laminated and coarse Damascus figures are manufactured, and make a very durable pair of barrels.

Charcoal iron is made up into medium and coarse figure Damascus and laminated barrels. This metal is composed of old files and pieces of steel of the same sort. It is broken up into small cubes, then put in the furnace and worked into a bloom; the bloom is then heated and rolled into bars ready for use.

This metal makes good and desirable barrels. The use of the above-described materials has been almost entirely superseded by the more modern methods of preparing gun-barrel metal right from the pig.

The best of pig iron is obtained and placed in the furnace and reduced to a fluid state. This operation cleanses it from all dross. It is then allowed to cool, and while the temperature is going down it is gathered and worked together in blooms, and it then goes to the steam hammer, under which it assumes the shape of square blocks. It then passes through various rolls until the diameter and length of bar required are attained. The hammering has condensed the metal and eliminated many of the impurities.

The rolling has augmented its tenacity and ductility, elongating and ramifying the fibers. The mild steel to be used in connection with the fine iron is prepared in a similar manner, and is made from best Swedish pig iron, and becomes very tenacious and elastic under the heating, hammering and rolling.

In these three operations there is a constant loss of metal. The loss in puddling is about 16 per cent, and rolling from 12 to 13 per cent.

Heating, Rolling and Hammering.

The bars being now ready are cut into equal lengths and huddled together, put in the furnace, heated and welded and elongated by rolling into rods. This heating, rolling and hammering is gone through with from five to seven times in the operation of making first quality brands.

The quantity of mild steel to be used in connection with the iron has been determined on, say 55 per cent of mild steel in rods and 45 per cent of fine iron in rods five-eighths inch square. If a fine figured Damascus is wanted, four rods of iron and four of steel are laid together, first one of steel, then one of iron, then one of steel and so on until all are bundled together, making eight in all. This bundle is then brought to a white heat and the successive layers of steel and iron welded together and rolled out in a rod; the rod again heated, brought out, placed in a machine for the purpose and twisted like a rope until it has ten to fifteen turns to the inch, the number of turns determining the fineness of the figure.

This severe twisting has shortened the rod to the desired length and increased its thickness 50 per cent.

Two of these solid spine rods are now placed side by side, with the twistings running in opposite directions to each other, reheated and welded into one, and rolled into a flat rod of say 9-16 of an inch wide for the breech ends of the barrels and 11-16 of an inch wide for the muzzle ends. The barrels are made in two parts, and in the last operation of welding, called "jumping," they are brought together in the middle.

These rods of 9-16 and 11-16 inches are again heated and twisted in the form of a spiral tube; this tube is heated to a white heat, and glowing under the master hand is by a quick and deft movement "jumped" on the anvil and the open coils welded together; they are then immediately placed on a grooved rest and hammered lightly to round them up.

Joining Breech and Muzzle.

All the coils for the muzzle and breech ends of the barrel having been thus welded, the next operation is to join the breech and muzzle together. This is a very neat and artistic piece of work, but is quickly and perfectly performed, and on first-class Damascus or laminated barrels would take the eye of an expert to detect the jointure; the whole tube, from breech to muzzle, looks as if made from one coiling of rods.

The ends of the two coils are heated and joined together; a light tap on the anvil and the welding is completed.

In all these operations of heating, hammering, twisting and rolling, the iron has been in the fire seven or eight times, and under each manipulation has grown purer, stronger with increased density and ductility, resulting in the strongest, and at the same time the most elastic iron known, with one exception, and that is the Widworth fluid compressed steel, of which mention will be made further on, it coming within the scope of these articles.

The tensile strength of high-class gun metal is enormous. Experiments made in testing a variety of rods show: A rod 6-16 inch wide by 5-16 inch thick and one foot long was equal to a tension of over 11,200 pounds. This mode of proper thickness carried out in a gun barrel would sustain a strain of over 6,000 pounds to the square inch of the barrel. It is, therefore, obvious the barrel is abundantly able to sustain the pressure exerted by gunpowder gas.

The idea is generally prevalent that gun barrels of all kinds are made from one piece of of iron or steel; that is, a solid bar of metal is prepared and a hole bored through it from end to end. This is true with some of the very cheap guns made from decarbonized steel.

Damascus and Twist Barrels.

I have sought to explain that Damascus and laminated barrels are made from two or more rods of different kinds of metal; twist barrels may be made from one or more rods. When made from one rod, the rod is simply coiled and welded.

The fowling piece must be light, so as to handle quickly and not fatigue the sportsman in carrying it, and at the same time sustain its proportionate charge of powder; hence, if the barrels are light they must at the same time be strong. All of which is attained by making the metal as described.

They are also beautiful to the eye, the mild steel and fine iron being incorporated so intimately and regularly form a beautiful curled figure. The figure is but faintly perceptible in the bright metal. It is only when the barrels are finished and the browning put on that it comes fully out; the rich, dark brown color is the iron, while the lighter shade is the steel; the two blended together and running regularly look not unlike a piece of lace work. Ladies who have had their attention called to this artistic work have admired it, and wondered why they had not known it before, and concluded a fine gun was something more than a mere piece of iron and wood.

To convey an idea of the expense of making up a pair of barrels in the waste of raw material, I may add, it takes nineteen pounds of prepared metal to weld and make up into an ordinary pair of 12-gauge barrels, which, when completed with top and bottom ribs and lugs, weighs four and one-quarter to four and one-half pounds.

A fine gun can only come from skillful hands; skillful hands are paid high wages. We must therefore reason that the prices put on fine guns are not too high. The possessor of a fine gun has a thing of beauty and a joy forever.—*Pittsburg Telegraph.*

PHOSPHORIZING WIRE.—A method of phosphorizing bronze or brass wire, followed by some foreign manufacturers, is as follows: The wire is put in a solution of from one-eighth to five per cent of phosphorus in ether, bisulphide of carbon, or olive oil; five to ten per cent of sulphuric acid, and eighty-five to ninety-five per cent of water. In this bath the wire remains until the metal begins to take up the phosphorus. The wire is then drawn to one number finer, and placed in a closed retort with a thin layer of phosphorus, so that the phosphorus vapor may spread over the surface of the wire. After this the wire is packed in charcoal, which is kindled, and after proper annealing, the wire is again drawn to a finer number. This process is repeated until the required fineness is obtained. Wire so phosphorized is very tough, takes a high polish, and does not easily corrode.

SCIENTIFIC PROGRESS.

Pending Problems in Astronomy.

At the late Philadelphia meeting of the "American Association for the Advancement of Science," the retiring president, Prof. C. A. Young, the well known American astronomer, in the course of his address spoke substantially as follows upon the interesting question of "The Pending Problems in Astronomy," which he regarded as urgently demanding solution. We copy from the report of the *Scientific American:*

An impression prevails that we already know the dimensions of the earth accurately; and yet it is not so, except so far as geodetic triangulations have been possible. Astronomical determinations of latitude and longitude do not meet the case. They give only the direction of gravity, and no linear measurement. We have no means of determining exactly the relative position of places separated by oceans. Nor do we know just what sort of spheroid the earth is; for every new continental survey calls for some fresh modification. A more important question is as to the uniformity of the earth's rotation on its axis, and as to the manner and extent of its variations. Only of late have we begun to suspect our unit of time and of length. Plainly any changes in the earth's form must change the length of the day: and there is reason to suspect that the earth's rotational motion is irregular, and consequently our time reckoning is wrong and a new unit will shortly be demanded. Can a unit be found that shall be free from local considerations and equally applicable wherever physical action prevades the universe? Another problem relates to the constancy of the position of the earth's axis in the globe. Other problems relate to the rigidity of the earth, its internal constitution and temperature.

The moon also sets us problems, as to her orbital action, surface, heat, and atmosphere. The difficulties in the way are some of them purely mathematical, and progress must be slow and painful. Others are physical, and grow out of contradictory observations. In the planetary system we meet with the same problems, in the main, that relate to the moon. It is our duty to continue to search for asteroids. There are signs pointing to the existence of a great world beyoud the remotest of the present planetary family. Mercury, Mars, Venus, and Jupiter, each offers enigmas for us to explain. The red spot on the latter has disappeared after baffling us for years. The problems Saturn are still more difficult. So remote are Uranus and Neptune that it seems a hopeless task to discuss their rotation, topography, and atmospheric peculiarities. The great problem of the absolute dimensions of our system is linked with that of the solar parallax, and obscured by many obstinate errors. Solar problems of great interest yet remain open. The sun-spots are not yet explained. The peculiar rotation, equatorial acceleration, chromosphere, and prominences, etc., of the sun are receiving much attention, and this is especially true of the maintenance and duration of solar heat. Meteors and comets furnish a crowd of problems; and when we come to the stars they are multiplied to myriads, and for their solution new methods, new instruments, must aid human observations. Prof. Young closed by a eulogy of astronomy as giving the human mind its most invigorating and ennobling exercise.

Methods in Physical Astronomy.

Physical astronomy is a science which is altogether modern and for the most part contemporaneous. Its foundation was the discovery of telescopes. The telescopic harvest was so nearly exhausted by Herschel that the need of further assistance was generally felt. Arago sought help from polarization and his investigations prepared the way for spectral analysis. The small mass of matter which constitutes the chemical molecule, when it vibrates freely in the gaseous condition, sends out a special system of waves which varies with the chemical character of the molecule. The system of luminous waves may be compared to the system of sounds given by a vibrating cord, a system which depends firstly, upon the length of the cord, secondly, upon the volume, the timber and other circumstances which accompany the vibration. In the preliminary steps of spectral analysis we find the names of Wollaston, Fraunhofer, Sir John Herschel, Talbot, Miller, Wheatstone, Swanmasson and Foucault. Kerschof and Bunsen made a synthesis of all these efforts and brought the method into its present general and practical form. When spectral analysis was presented to the scientific world it held in one hand cæsium and ruhidium, in the other a list of metals recognized in a star situated at a distance which is almost inconceivable. The subsequent discovery of telluric bands and the elective absorption exercised by atmospheric vapor, prepared the way for the study of planetary atmospheres, which, when it becomes more complete, will show whether our atmosphere represents a type which is everywhere reproduced, or whether the varieties of atmospheric composition will lead us to admit the appearance and the development of life in media which are essentially different. The most recent method of physical astronomy is photographic. It has already brought a marvelous help to scientific study. The first image of a fixed star upon the daguerrean plate was that of the sun. It was obtained by Messrs. Fizeau and Foucault, the authors of the admirable methods of measuring the velocity of light, on the second of April, 1845. During the same year photographic impressions of fixed stars were obtained in the United States, and soon afterwards Rutherfurd and de la Roe produced their beautiful photographs of the moon. Rutherfurd, Gould and Draper extended stellar and nebular photography and Janssen crowned the work by his solar photographs, some of which resulted from an exposure of less than one ten-thousandth of a seconds. The photographic plates which are now prepared are not only sensitive to all the elementary rays which excite the retina, but they even extend their power into the ultra violet regions and into the opposite regions of obscure heat, in both of which the eye is equally powerless. Well, then may Janssen say, that "the photographic plate will soon be the true retina of the savants."—*Lumiere Electrique.*

The Matrix of the Diamond.

Until the South African mines were discovered, the diamond was always found in stands and gravels, different from the minerals in which it was believed to be formed. At Griqualand West, however, the consolidated eruptive mud of the mines was believed by some to be the true matrix of the diamond; but opinions differed on the question, and arguments were found on both sides. M. Chaper, a French geologist, has, however, during a scientific mission to Hindustan, succeeded in finding the diamond in its mother rock. At Naizam, near Bellary, in the Madras Presidency, M. Chaper has found the diamond in a matrix of rose pegmatite, where it is associated with corundum. The tract of country is almost denuded of trees, bare and rocky, and the rains wasting the rocks every year expose fresh diamonds in the soil. The rock is traversed by veins of feldspar and epidotiferous quartz. Here the diamond is always found associated with epidotiferous rose pegmatite. The diamond crystals observed are octahedral, but less distinct in line than the stones of South Africa, which seem to have been formed in a freer matrix. It follows from M. Chaper's discovery that diamonds may exist in all rocks arising from the destruction or erosion of pegmatite—for example, in quartzites with or without mica, clays, pudding stones, etc.—*Engineering.*

ERRICSSON'S SOLAR MOTOR.—After experiments extending over twenty years, and involving the construction of various different forms of apparatus, Erriesson has produced a solar boiler by which he obtains a pressure upon the piston of thirty-five pounds to the square inch, and a velocity of 120 turns a minute. Such a motor may he favorably employed in hot countries, like the desert of Sahara, where several of these machines are practically at work. They might also, beyond a douht, be set to work advantageously in many parts of this State, particularly in the southern and western portion of the San Joaquin valley, where they would do good service in pumping for irrigation.

STRETCHING OF THE BROOKLYN BRIDGE RAILWAY CABLE.—The strain upon the bridge cable in pulling the ears has had the result of stretching it gradually, until it was recently more than 100 feet longer than when the ears were first started. Early one morning a gang of men from the Treuton manufactory, where the cable was constructed, shortened it, under the supervision of the bridge engineer. A piece of the cable 30 feet long was cut out, and then it was respliced in time to draw the cars as usual in the morning.

THE HUDSON RIVER TUNNEL about which so much was said a few years ago, and in undertaking the construction of which upwards of $1,000,000 was expended, has long since been abandoned, and, very likely, forever. The company met with almost insurmountable difficulties from the start. The excavation that was made is full of water.

THE MOON AND THE CLOCK.—M. Poincaire contends that the attraction of the moon modifies the intensity of gravitation. Hence at the equator the clock is retarded by half a second yearly by the combined attraction of the sun and moon, and advanced a second at the poles.

THE SOAP ROOT PLANT.—According to the investigations of A. Rosoll, the saponine which is contained in the sap of the soap root plant, can he separated in form the of small, irregular white lumps, either by drying, or by treating these slices with absolute alcohol in ether.

HEAT OF THE SUN.—Mr. Erriesson has deduced from his experiments with his solar motor that the temperature of the sun cannot be less than 1,303,640° F.

MINING AND SCIENTIFIC PRESS.

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Passing Events.

The Grand International Brotherhood of Locomotive Engineers is holding its annual reunion in this city this week. This is the 21st annual convention, though it has never met here before. It numbers some 16,000 men, and is a very powerful organization.

Current mining news shows nothing of a specially important nature. A few good strikes are being made in different camps, and such news as is of general interest we have summarized in the usual columns.

Dullness in business matters continues in this locality, and official inquiry is being made as to the causes, and such remedies as may be applied will be suggested. During the week the formal transfer of a certain section of the Southern Pacific road has been made to the Atlantic and Pacific.

What may be called the first rain of the season fell one day this week, though it did not continue long, and was followed by strong westerly winds.

THE two glasses for the Lick observatory have been at last successfully cast, after a delay of over two years and nineteen attempts to cast the crown glass. The crown and disk glasses will now be worked into proper shape as soon as possible by the contracting opticians, Messrs. Alvan Clark & Son, and the work on the observatory will be proceeded with excepting the building of the dome, which cannot be finished until the length of the telescope into which the glasses go has been decided upon.

Discharge of Stamp-mill Batteries.

In crushing quartz in a battery it is customary to employ screens at the front and back of the mortar of a sufficient degree of fineness to allow the material to pass through when it is pulverized to the desired fineness, the fall of the stamps throwing it outward against the screens until it will pass through. Two objections are commonly found to the operation. One is that much of the fine material is retained in the mortar after it is reduced as much as necessary, by not being thrown against the screens, and it thus remains to impede the working of the stamps; and the other is that the coarser ore is thrown against the fine screens with so much force as often to break them.

Stamp-batteries have been made in which two sets of screens have been used—one finer than the other—to separate the coarser from the finer ore after it has passed from the battery. They have also been constructed in such a manner that the ore was placed upon gratings, through which it would fall when crushed to a certain degree of fineness, and has then been elevated and passed through screens, by which the finer ore is separated from the coarser particles. Mr. George H. Malter, the well-known quartz mill builder of this city, has, however, just patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, an improved stamp-battery, which embraces new features different from these, and by which a rapid discharge of the battery is effected.

In his invention Mr. Malter employs screens of coarse, strong wire, having meshes considerably larger than the required fineness of the material to be crushed. These are fixed in the sides of the mortar, and when the stamps fall upon the rock they crush it and throw it outward at each blow. These screens are strong enough to resist the force of the larger pieces of rock which strike them, and all which is fine enough will readily pass through their meshes, thus rapidly relieving the mortar and making it crush more rapidly.

Below the screens, and upon the sides of the mortar, are placed other screens, which lie with their surfaces upward, so that the material which passes through the other larger screens will fall upon them. They stand at such an incline that all particles which cannot pass through them will slide off and fall into a receptacle, from which they are taken by the buckets of an elevator, and are carried upward to a point from which they are again delivered to the mortar, where they will be acted upon by the stamps until reduced to a sufficient degree of fineness.

That portion of the ore falling upon these inclined screens which is fine enough passes through them, the meshes being as fine as necessary; and as the ore does not strike these with much force, they are not broken or injured. The ore passing through these screens is carried out by conveyors to the opposite side of the elevator, and is ready for the next steps in the process of reduction. That portion of the mortar below the feed opening—the fine screens and conveyor—is inclosed or cased in, to prevent the escape of dust. By this peculiar construction the rock is much more rapidly crushed, and does not pack in the mortar or clog it, and the screens will wear much longer.

Montana Mines.

No part of the United States is advancing as rapidly in mineral development as Montana. The most flourishing mining town in the whole country is Butte, where numerous reduction works are constantly beneficiating the heavy ore yield of the many producing mines. Abundant capital has been drawn in that direction by the promise of the mines, and in most instances remunerative investments have been the result. Aside from precious metals, Montana now comes next to Michigan in her copper production, and her yield is constantly increasing. Not only is the region around Butte very productive, but other sections have their rich and productive mines, which are adding to the world's wealth day by day.

We have always devoted much space in the PRESS to consideration of Montana's mineral resources, and of late have been able to obtain abundant additional information from a special correspondent, sent there for the purpose. In this number many columns are devoted to descriptions of the leading Montana mines, and we shall endeavor in the future, as in the past, to gather as much information as possible concerning them.

Copper Minerals.

Copper occurs in a variety of forms, but many minerals containing it are much too poor to allow of its profitable extraction. It is found in combination with sulphur as a sulphide or sulphuret, with oxygen as in oxide, and with carbon, hydrogen and oxygen as a hydrated carbonate. It is found also native and associated with most of the metals, common or rare. It is obtained for use mainly from native copper, cuprits, melaconite, azurite, malachete, chalcocite, chalcopyrite and tetrahedrite.

To such persons as are interested in copper mining a list of the principal copper minerals found in the United States, and their composition, will be of value for reference. There are many of them, most of them having one or more common names by which miners know them, as well as names by which mineralogists know them. We shall give the list in alphabetical order, with the scientific and common name, and the composition:

Aikinite (needle ore, acicular bismuth, cuprous bismuth). Composition—copper, bismuth, lead and sulphur.

Algodonite (arsenide of copper). Composition, copper and arsenic.

Atacamite (muriate of copper, oxy-chloride of copper). Composition—copper, chlorine, oxygen (water).

Auricbalcite (carbonate of zinc and copper). Composition—copper, zinc, carbon, oxygen (water).

Azurite (mountain blue, blue carbonate of copper, blue malachite, azure copper ore). Composition—copper, carbon, oxygen (water).

Barnhardrite (sulphide of iron.) Copper, iron and sulphur.

Bornite (purple copper ore, variegated copper ore, *ererbesite*, sulphide of copper and iron). Copper, iron and sulphur.

Bournonite (triple sulphuret of copper, lead and antimony). Copper, lead, antimony and sulphur.

Brochantite (sulphate of copper). Copper, oxygen, sulphur (water).

Caledonite (cuprous sulphato-carbonate of lead). Copper, lead, carbon, oxygen and sulphur.

Carrollite (sulphide of cobalt and copper). Copper, cobalt (nickel) and sulphur.

Chalcanthite (blue vitriol, copper vitriol, sulphate of copper). Copper, oxygen and sulphur (water).

Chalcocite (copper glance, vitreous copper, sulphuret or sulphide of copper). Copper and sulphur.

Chalcopyrite (copper pyrites, pyritous copper, sulphuret or sulphide of copper). Copper, iron and sulphur.

Chrysocolla (mountain green, mountain blue, silicate of copper.) Copper, silicon, oxygen (water).

Covellete (indigo copper, blue copper, sulphide of copper). Copper and sulphur.

Cuprite (red oxide of copper, cuprous oxide). Copper and oxygen.

Domeykite (arsenical copper, arsenide of copper). Copper and arsenic.

Enargite (sulph-arsenite of copper). Copper, arsenic and sulphur.

Harrisite (sulphide of copper). Copper and sulphur.

Malachite (mountain green, green carbonate of copper, green malachite, green copper). Copper, carbon and oxygen (water).

Melaconite (black oxide of copper, black copper, cupric oxide). Copper oxygen.

Native copper (sometimes with silver). Copper (silver).

Pseudomalachite (phosphate of copper). Copper, oxygen phosphorus (water).

Stromeyerite (sulphuret of silver and copper, silver-copper glance). Copper, silver, sulphur.

Tennantite (sulph-arsenite of copper). Copper, sulphur, arsenic (iron).

Tetrahedrite (gray copper ore, sulphide of copper and antimony, with various other sulphides). Copper, antimony, sulphur (arsenic, bismuth, silver, mercury, zinc, etc).

Torbernite (copper-uranite, phosphate of uranium and copper). Copper uranium, phosphorus oxygen (water).

Uranochalcite (oxide of uranium with oxide of copper and sulphate of lime). Copper uranium, oxygen, sulphur, calcium (water).

Vanquelinite (chromate of copper and lead). Copper, lead, chromium, oxygen.

Whitneyite (arsenidi of copper). Copper and arsenic.

Of course many of these copper minerals are not such as are worked for copper. The list, which is from the appendix of Brown's Manual of assaying, is given merely as a matter of reference, so that miners knowing the common name, may know the mineralogical name and composition of the mineral.

Taking Up Stone Lands.

It may not be generally understood that the Act of Congress of 1878, for the sale of timber lands in the States of California, Nevada, Oregon and Washington Territory, applies as well to stone. That is, any one may take up 160 acres of land, valuable chiefly for stone, on the same terms as timber lands, at a minimum price of $2.50 per acre. It does not apply to lands containing gold, silver, copper, quicksilver, coal, etc., and refers to land unfit for cultivation and chiefly valuable for timber and stone.

When any one applies to purchase a tract for the stone contained on it, under the Act referred to he must make affidavit of citizenship or intention of becoming such. He must also make a sworn statement setting forth that the land is uninhabited, is unfit for cultivation, is chiefly valuable for timber or coal, contains no mining improvements, or deposits of gold, copper, silver, coal, etc.; that it is not bought for speculation, but in good faith for use, and that he has made no agreement to dispose of it to others.

Then he must publish the required notice, and have an affidavit of the publisher of the paper in which the notice was published. Two disinterested witnesses must swear to the non-mineral character of the land. This testimony must all be taken before the Register and Receiver, and if no adverse claim is filed, the applicant will be allowed the entry and get his receipt for the purchase money. The Register or Receiver is entitled to a fee of $5, and 22½ cents per hundred words for testimony reduced by them in writing for the claimants. In case of an association of persons making application for such an entry, each of the persons must prove requisite qualifications, and each name must appear. They must also unite in the regular application for entry, which will be made in their joint names, as in other cases of joint cash entry.

Ten-Acre Tracts in Placer Locations.

Concerning placer locations the United States laws provide that legal subdivisions of 40 acres may be subdivided into ten-acre tracts. This subdivision is intended for the greater convenience of miners in segregating their claims both from one another and from intervening agricultural lands. The land office holds therefore that under a proper construction of the law these ten-acre lots in mining districts should be considered and dealt with to all intents and purposes as legal subdivisions, and that an applicant having a legal claim which conforms to one or more of these ten-acre lots, either adjoining or cornering may make entry, after the usual proceedings, without further survey or plat.

In cases of this kind, however, the notice given of the application must be very specific and accurate in description, and as the 40 acre tracts may be subdivided into ten-acre lots, either in the form of squares of 10x10 chains or of parallelograms of 5x20 chains, so long as the lines are parallel and at right angles with the lines of the public surveys, it is necessary that the notice and application state specifically what 10-acre lots are sought to be patented, in addition to the other data, required in the notice.

Where the ten-acre subdivision is in the form of a square it may be described, for instance as "S. E. ¼ of the S. W. ¼ of N. W. ¼," or, if in the form of a parallelogram, it may be described as the "W. ½ of the W. ½ of the S. W. ¼ of the N. W. ¼ (or the N. ½ of the S. ½ of the N. E. ¼ of the S. E. ¼) of section —, township —, range —, as the case may be; but in addition to this description of the land, the notice must procure the other date that is required in a mineral application, by which parties may be put on inquiry as to the premises to be patented. The proof submitted with applications for claims of this kind must show clearly its character and the extent of the improvements upon the premises.

DON'T GO TO TUSCARORA.—The *Times-Review* gives the warning. Quite a number of miners who have lately arrived are looking for places, and we would advise no more to come here at present, as the chances are they would be disappointed in their quest of work.

VANDERBILT has been obliged to sell $35,000,000 of his government bonds to bolster up his railroad stocks. He has been a heavy looser by the depreciation in these stocks.

Ore Dressing.

Mr. Wheaton B. Keenhardt, M. E., has been contributing to the School of Mines Quarterly, of Columbia College, a series of articles describing the foreign methods for the mechanical concentration of ores. These articles have been revised and corrected by the author and published in book-form by John Wiley & Son, of New York, under the title of "The Practice of Ore Dressing in Europe." The work is really a very useful one to all interested on the subject of ore concentration, as it notes the advances that have been made in ore dressing in the past few years and gives every detail necessary for a full understanding of the subject. The following paragraphs on "Cleaning" of ore are quoted from the work referred to.

The grit, sand and slime which coat the ore, and more especially the fine mine ore, as it is brought to the surface, are washed off to facilitate manual sorting and keep the work of jigging neat. The mine fines are usually cleansed while being classified into several sizes; a sharp spray of water either plays upon and passes through the sizing-screens, or, to be more effectual when revolving screens are employed, a fixed hollow pipe is used as axle of the screen, and the water issues from it directly upon the ore. Warm water from a steam condenser is of considerable advantage in the cold season, because of the hand-picking which follows sizing. The dirt derived from the washing is collected in vats and treated with other unclassified sands. The cleansing of the lump ore intended for spalling or coarse hand dressing can almost always be effected by merely playing a hose upon it; but lump ore that is to be crushed by machines is not subjected to cleansing, nor is washing found necessary after the crushing of this ore and preparatory to hand-picking.

Certain classes of ore, however, and notably zinc ores and some ores of iron, contain a quantity of stiff, clayey gangue, which frequently envelops the ore pieces, large and small, and cements them into masses of considerable size. Simple washing will not remove the clay; it becomes necessary to pass all the ore through a special cleansing apparatus—for example, through a large revolving conical drum, some 15 to 18 feet long, and 12 feet in diameter, in which the ore, besides being exposed to the vigorous action of water, is raised by upturned blades, and then falling upon other blade edges, gradually breaks loose from the clay and is cleansed. At the discharge end of the washer there is a draining screen. The cleansed ore passes over it, and then generally drops upon the sizing-grates which separate the lump from the finings.

Zinc.

It is a recognized fact that the ores of zinc in this country are equal to the best in Europe, but our methods of mining and preparing them for market are wasteful, and the methods of smelting are crude and extravagant, being very much behind European practice in technical value and economy. Of course the peculiar conditions of our ore supply, and certain general limitations to improvement imposed by the nature of the operations involved in the smelting of zinc, partly explain this, but we have much to learn yet in this industry.

In its essential features the metallurgy of zinc is the same all over the world. The metal must be distilled in fire-clay vessels, in the presence of carbon, and condensed out of the reach of oxidizing agents. The dimensions of the distilling vessels are restricted within very narrow limits by the nature of refractory materials and the thickness of the charge through which the necessary heat to effect reduction can be economically transmitted, and but little improvement is to be hoped for by a change in these dimensions.

The operations to which the ore and products must be submitted are numerous, and the repeated handling of them cannot be avoided. The recent improvements in European practice have not been the results of changes in form of furnaces or in the method of treating the ore, but have resulted from careful economies in the use of labor, fuel and ore, and have only kept pace with the concentration of mining and smelting industries into the hands of strong companies, and are in general such as can only be introduced by companies with abundant capital and where large operations are carried on. Moreover, the policy of these companies has been to regulate the output and the product, to give a steadiness of value to metal and ores, so as to render the investment of capital safe, which would otherwise have been precarious. The production of zinc in the United States is about 34,000 net tons per year.

In September the mining dividends paid here were $238,250. These included the Bonanza King Mining Co., 25c per share, $25,000; Father de Smet, 20c, $20,000; Homestake; 20c, $25,000; Idaho, $7.50, $23,250; Ontario, 50c, $75,000; Plymouth Con., 50c, $50,000; Paradise Valley, 10c, $10,000; Syndicate 10c, $10,000.

A cloudburst at Pachuca, Mexico, on the afternoon of Sept. 27th, caused a terrible inundation. The amalgamating works were destroyed and considerable silver under treatment lost. It is estimated that thirty persons were killed. A great deal of property was destroyed and many cattle drowned.

Underground Haulage.

In this country we have not paid much attention as yet to improving our systems of underground transportation of ore and water in our mines. In most places the cars are moved by hand, in others by mules or horses, and in some few instances in tunneling, small locomotives are used. The systems of wire rope haulage, so much in use in Europe have not been largely introduced here. There they use compressed air and electricity in their operations in many instances, and are constantly experimenting and improving. Steel tracks are displacing the old wooden tramway, and the endless rope, chain and compressed air have driven out the horses.

Where the mineral has to be drawn up considerable gradients on heavy roads, steam power is now in operation at many places; but even that is giving way to compressed air. On the continent, however, an electrical locomotive has lately been introduced, and it is by no means unlikely that electricity as an underground motive power will become a fact in this country, and that at no distant period. From experiments made, and from actual working, the known systems of underground haulage give the following results as to the power utilized:

Compressed air	35 to 56 per cent
Tail rope	50 to 60 "
Endless rope	75 to 90 "
Endless chain	72 to 80 "
Electric locomotives	22 to 32 "

Where engines are used for underground transport, the best kind has been found to be the horizontal direct acting double cylinder. It has also been found that where the inclination is not more than 1 in 28, the empty carriages will draw out the rope from a fixed engine without the employment of a tail rope; but where the inclination is less, the use of the tail rope will be found advantageous. By attention being paid to the underground haulage, more especially at the present time, when the depression in mining is so general, a considerable saving may be effected in the working of mines, and losses prevented, if profits are not actually made.

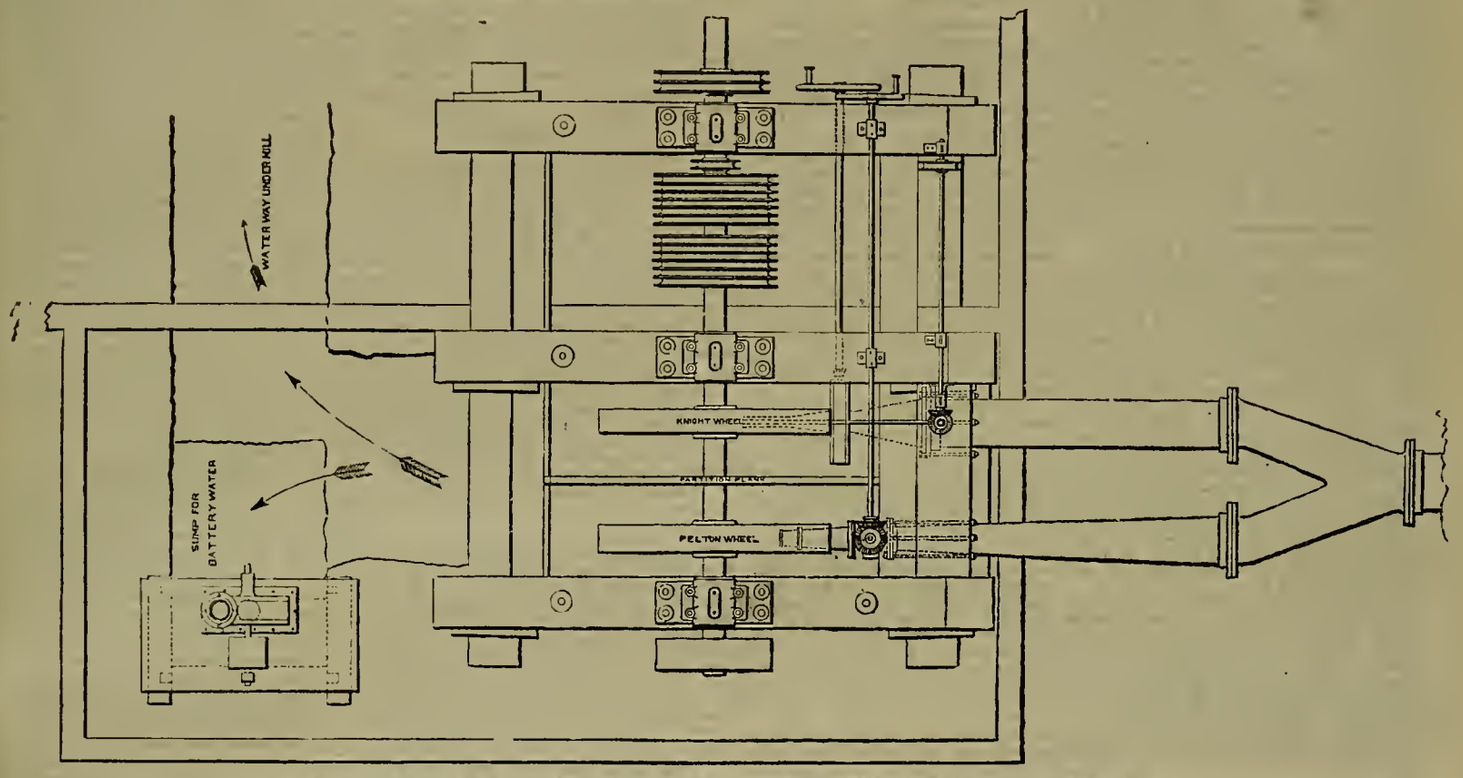
Mr. Adler, near Windsor, Sonoma county, is having an artesian well bored. At a depth of 60 feet a bed of blue clay was struck. One hundred feet in the clay a stratum of wood, 10 feet in depth was encountered, and underneath this wood, pieces of bone of a good-sized animal was brought up with the auger, a depth of 170 feet from the surface. This is on the Santa Rosa plain.

At the north end of the Comstock the next work in order is the cutting out of a station at the 3,300 level, preparatory to starting a west cross-cut. This will be work of great interest to mining men everywhere, for at that point is the deepest excavation in America.

Locomotive Engineers.

The Brotherhood of Railroad Engineers is in session in this city, at the Baldwin Theater. On Wednesday they hold their first meeting and were addressed by Mayor Bartlett, Wm. H. Barnes and others. Grand Chief Engineer, P. M. Arthur, delivered his annual address, from which we take a few extracts:

Mr. Arthur began by referring to the time when a small band of men met together in the city of Detroit, 21 years ago, for the same noble purpose which had drawn the delegates of the convention together at this time, saying that it was almost impossible to believe that so small a beginning could reach in so short a time such stupendous proportions. For the past fiscal year, which embraced only eleven months this time, owing to the journey across the continent, the reports were most favorable. The brotherhood had not been affected by the general depression of all branches of industry, but had steadily advanced. Twenty-four new divisions had been established, making a total number of 258.



PLAN OF THE WATER POWER MACHINERY IN THE ALASKA 120-STAMP MILL. (See page 209.)

The membership was never so large, numbering 16,000 men, many of whom were young. It was good for young men to be in the brotherhood. They would be useful in the future, after long training, as leaders. Here the Grand-Chief Engineer gave young men some excellent advice, pointing out the great results of perseverence, by which the very odds and ends of time might be worked up into results of the greatest value. Referring to the two divisions in Mexico, the speaker said that wherever there was a railroad there would the brotherhood be a necessity.

The great importance of the Insurance Association was dwelt upon at length, and all members of the brotherhood were advised to insure in it. "Our membership," said the Chief Engineer, "has largely increased during the year, which enables us every now and then to pay a claim from the surplus. I do not know that we could do better."

We had at the close of the last fiscal year, Sept. 30, 1883, 3,320 members. Died during the year, 42; disabled, 4; forfeited, 207; and had on August 31, 1884, 3,984, showing a net gain of 664.

"We have paid 43 claims, of $300 each, amounting in the aggregate to $126,000, making a grand total of $1,533,169 61 that we have paid to the heirs of deceased members since it was established, 16 years ago, besides disbursing $500,000 to the sick and needy, which went to cheer the hearts and homes saddened and darkened by the shadow of death."

Ten miles of the road from Los Angeles through the San Gabriel valley are now graded and ready for ties and rails.

Butte City, Montana.

(*Continued from page 210.*)

10 stamps, and is managed as a custom mill by Messrs. Donahue & Moore, two gentlemen of experience, who handle their ores thoroughly, and get good results.

The Liquidator Mine.

This mine lies close to Clark's Colusa, joining it on the northwest. It has not been suuk to a great depth—about 200 feet—hut ore is being taken out that runs high in coppers, all of which is crushed by rock-breakers fine enough to sack, and then shipped to the East or to foreign parts for reduction. A large quantity of ore now lies in the dumps of this mine which could he handled with profit by concentrating works. Mr. McDermott, one of the owners of the Liquidator, is also superintendent.

The Mountain View.

Tbis mine is well named. It lies on the summit of the hill, northeast of town. The owner, Mr. C. X. Larahie, is one of the pluckiest mine owners in Butte. He bas consistently held to the theory alluded to in this letter, that the Original, the Gagnon, the Parrot and the Anaconda are upon the same ledge as the Liquidator and the Colusa. He was formerly interested in the St. Lawrence, and believing that at the location of the Mountain View the parent ledge could also he he tapped, he sold his share of the St. Lawrence for $31,000, and at his individual expense has carried down a shaft for 638 feet, and is now drifting with the expectation of striking ore which will rival that of his neighbors on either side. He has already shipped ore that run 26.6 to 50.5 in copper, and has 1,500 tons on his dumps, of a lower grade, that assays well. Much attention is directed to the Mountain View, and all lovers of pluck and perseverance wish Mr. Larahie success even beyond present appearances.

The Original. Gagnon and Char Grit.

These three mines are in close proximity, the Original lying farthest west, then the Gagnon, and to the northwest of that the Char Grit. H. C. Kessler, a long-time friend of the PRESS, is superintendent of the latter. At present it is showiug well. The Gagnon is one of the first locations in Butte. It is told of this mine that some of its early owners had taken out some rusty-looking quartz which they deemed of little value. A. J. Davis, at that time owner of mill property in Butte, suspected its richness, and hought the rock at about $5 per ton. It yielded some 200 ounces of pure silver to the ton. Mr. Clark's eagerness to purchase the Gagnon finally hetrayed to interested parties its richness, and the mine has since been valued upon a different hasis from that of an ore-producer at $5 per ton. At present 30 to 40 tons of ore that will assay $50 to $60 per ton, are being prodnced daily.

We cannot do hetter in closing this resume of the work at most of the prominent mines at Butte, than to insert a quotation from the holiday number of the *Inter-Mountain* for 1883-4, which was a paper gotten np with great care, and a remarkaole production for any city less than a metropolis. It said: "The silver and copper production of Butte for the year 1882 was $6,200,000. During 1883 a material increase occurred, as will be seen by the following table:

Lexington	$1,289,655 34
Silver Bow Mill	367,500 00
Moulton	376,684 20
Liquidator	141,750 00
Montana Smelter	2,103,420 00
Anaconda	1,702,680 00
Dexter Mill	195,190 00
Alice	1,010,934 00
Colorado Smelter	740,000 00
Parrot Smelter	1,000,000 00
Total	$8,927,843 54

"In addition to the above products crude ore shipments from the Original, Gagnon, Lexington and other silver mines, some of which went to Colorado and some to Utah smelters, aggregate 7,000 tons, which, averaged at $70 (and that is the lowest figure that would pay for shipping) makes $490,000. The Butte placer mines produced $25,000 during the year. The Anaconda has on its dump at least 100,000 tons of ore extracted, and the Colusa has also a large extracted reserve. Ten million dollars is the lowest possible estimate which can be placed on the silver, copper, and gold product for the year 1883."

Some place the estimate as high as $13,000,000 for 1884. Should the price of copper he maintained even to its present figures, the output of this camp, after the completion of works now in process of erection, will be something enormous, and will place Butte city high in the list of metal prodncing cities of the world.

In another column is printed an article on the business affairs of Butte.

Patterson Mining District.

[From our Traveling Correspondent.]

EDITORS PRESS:—It has been about five years since prospecting began in earnest here. In the mean time many locations have been made and a very considerable amount of work performed. The claims are situated in Mono county, California, hordering on the State line of Nevada and are better known perhaps as the Sweetwater mines. They are about 40 miles distant hy stage road from Hawthorne, the present county seat of Esmeralda county Nevada, and one of the principal shipping points on the line of the Carson and Colorado Narrow Gauge Railroad.

The mineral helt is represented to he 7 miles in length by an average of 2 in width, the formation porphyry, with syenite one-half mile wide on the west.

The Summers Con. M and M Co.'s Property.

Is one of the oldest and least developed locations. It consists of a ten-stamp mill with as yet hut 5 stamps in place and four claims, to wit: the Kentuck, from which most of the ore has been derived the Georgie, the Howell and the Mayhelle. The greatest depth from surface reaches 406 feet. The ore runs from $35 to $80 per ton—battery samples—amalgamating from 75 per cent to 87 per cent. It is free silver ore, carrying a large percentage of chlorides. The quartz from the present and lowest workings has thus far averaged $68.85 per ton.

The books of the company show a total shipment to September, 1884 of $180,616, the principal portion through Wells, Fargo & Co's. office at Sweetwater. This is quite a fine showing in view of the fact that the ore has been packed four miles over steep mountain trails, saying nothing of the many other disadvantages arising from lack of capital, incident to most new mining districts.

Something of Other Locations.

Six or more tunnels are at present heing driven to gain a depth of from 100 to 200 feet; viz., on the Lady Hays lode, at the extreme south end of the mineral belt, and further north on the Nellie, Homestake, Poverty, Comstock and Star.

Tbe Poverty, Star and Nellie have reached their ore veins, finding first-class rock. The Homestake has struck her front vein, eighteen inches in width, with ore averaging $40 per ton. Her hack lode when reached is expected to be found full five feet thick, judging from surface and other indications. It is reported that 2,500 pounds from this mine yielded $234. The Poverty has ahout thirty tons on the dump ready for the mill. The Nellie, the property of Messrs. Sayers & McKnight, has from three to four feet of rich pay ore, estimated hy some to work as high as $100 to the ton. The Lady Hays is down 300 feet, has fifty tons on the dump, and is represented to give high average assays.

The Comstock has been stripped off the distance of 200 feet, showing an ore vein varying in width from four to twenty feet. The ore of this mine carries thirty-three per cent in gold, heing an exception to most mines of the district which are almost wholly silver-bearing.

Of other claims may be mentioned the John Franklin, with from three to six feet of good ore; the Lookout, the Siverado, the Mineral Chief and the Great Western. The last named has been laid hare for 500 feet in length. It is estimated that there are not less than 50,000 tons of ore in sight that will average $30 per ton, while a portion of the vein gives assays from $500 to $2,000. The Silverado has four tunnels reaching the lode at different depths. One hundred tons are said to have worked $95 per ton. Ahout 250 tons are now on the dnmp awaiting the new custom mill of five stamps, of Messrs. Kilpatrick & McCurdy, which is now ready to start up, furnished with all modern improvements and everything necessary for successful working. A. C. K.

Duncan vs. Frue.

The manufacturers of the Duncan concentrator make the following statement:

"In your issue of the 30th ult. an effort was made by the agent of the Frue concentrator to impeach the correctness of the report of the competitive test recently made hetween this machine and the Duncan at Carlisle mill in New Mexico, on the ground that the company referred to purchased the machines then used and subsequently ordered another lot. It now appears that the first machines mentioned did not give any such results as were guaranteed either in working the tailings of the Duncan or in saving amalgam. In consequence of their not having a sufficient number of Duncans to handle the pulp from the hatteries, the Frues were accepted, they heing already in place, rather than suffer the delay necessary to procure the same number of Duncans and get them ready to run. The manager bas, however, had occasion to regret this dccision as further experience has demonstrated the great superiority of the Duncan."

"The snbsequent order referred to, it also appears, was given hy the mine owners without the knowledge of or consultation with the manager of the mine. The attempt on the part of the agent of the Frue to discredit the statement of Col. James in regard to the fairness of the trial, or correctness of results, will not add to their reputation nor that of their machine. Col. James has long heen identified with the mining interest of this coast and is universally regarded as a high minded and honorahle gentleman, whose opinions and statements are not marketahle nor to be called in question."

THE agent at the Nez Perce reservation in Idaho says of the proposed return of the Nez Perce trihe to Idaho from Indian Territory: "I do not consider it advisahle to allow Chief Joseph and those who took part in the massacre to return. I think the halance could return with safety to themselves. and without causing disturbance on the part of the settlers."

The Ores of Butte City and Their Treatment.

In connection with the intelligence which we have already given our readers concerning the mineral resources of Moutana, but more especially of Butte City, we are assured that there must be a curiosity to know more ahout the peculiar character of the ores taken out and the method in wbich they are treated at the mines or works adjacent. We have found in the *Inter-Mountain* a carefully prepared article on the first hranch of this subject, which we quote helow. Following this we give a detailed description of the method in which ores are treated at the Parrot smelter, at Butte City. For the latter we are indehted to Mr. C. C. Woodhouse, formerly connected with tbe Parrot. As to tbe work nnder this latter head, it may he remarked that methods vary slightly in different smelters, hut the manner of operations at the Parrot is typical of the hest system yet adopted in Montana. The Parrot is only one of several works of the kiud in its community, though at present tbe largest in operation, its monthly production being, approximately, one million pounds of pure copper per month. The new works now heing built by the side of the former smelter will fully double the capacity of the Parrot property as a metal producer.

The Ores.

The ores of Butte are divided into three classes, according to the treatment they receive: 1st, chloridizing and milling; 2d, smelting or matting; 3d, concentrating and matting; 4th, shipping. The first is principally a free or sulphurous roasting aud milling ore assaying from $35 to $200 in silver, with an average value of $40. The second is a sulphurous copper ore sometimes carrying silver and assaying from 20 to 40 per cent copper and from $15 to $60 in silver. The third is a lower grade of copper ore assaying from 10 to 25 per cent copper. The fourth is a high-grade copper ore carrying some silver, which is shipped in a crude state to Swausea. It assays from 50 to 76 per cent copper and is mostly a copper glance, as in the case of the Anaconda. Under the reduced schedule of rates recently adopted by the Union Pacific company, it is now possihle to ship at a profit, copper ore carrying anything ahove 25 per cent. The charges to Swansea are about $33.20 per ton, which is likely to be reduced still more within a few months.

In the mines of Butte, tbe backs of the silver and copper lodes down to the water level—which varies in depth from 20 to 50 feet—are frequently much decomposed and are of true gossany character, which is the usual result of the decomposition of copper and silver ores occuring in siliceous gangue. The surface ores in the silver mines may be described as a porous quartz filled with oxidized metal generally as a chloride if silver and as a green carhonate if copper, though in some of the copper mines the surface ore has carried no copper above water, heing a low grade of silver-bearing rock.

In the copper and silver mines the copper often occurs as an oxide, but far more frequently in an amorphous form. Other metals that occur in tbe decomposed quartz are the oxides of manganese and iron, which are invalnable for fluxing purposes, the former occurring as a black variety and the latter as hlack, red and yellow ochres. The minerals reprcsenting the normal or undecomposed ores are of a sulphurous composition, and according to locality of mine may be either sulphide of copper or sulphide of copper and iron, or sulphide of silver. When the association of silver and copper occurs, the former is often found in a native state. The ores of copper are usually of the varieties known as bornite or horseflesh ore and copper glance and pyrytes varying from 30 to 76 per cent of copper. The lower grades of copper ore are also sulphuretted, but being of greater specific gravity than the foreign quartz material with which the metal is combined, it is susceptihle of easy and inexpensive concentration. Grey copper occurs but sparingly and is not in any sense a characteristic mineral.

In some mines located in the western portion of the camp, no copper occurs, the only ore being argentite or sulphide of silver in quartz. Parargarite and prousite occur in some places, hnt the sulphide is the most ordinary ore. In some cases development has shown the silver ore to he entirely replaced hy copper glance containing from 20 to 50 ounces in silver as in the Anaconda, Bell, Colusa and Parrot. Arsenic, zinc and antimony are found to some extent in all the ores of Butte, but not in sufficient quantities to cause serious trouhle in reduction. In the Colusa the percentage of arsenic varies from 1 to 2½ per cent, but is readily eliminated by the process employed at the smelter. Most of the copper and silver ores have a quartz matrix being more or less intimately associated with rhodonite, which is the silicate of manganese hetter known to the miners of Butte as "pink manganese."

Methods of Treatment at the Parrot.

The ores are brought from the mines to the company's reduction works—a distance of one mile—in small cars on a narrow-gauge railway. The high-grade ores are dumped at a place convenient to the wastiug kilns and leveled places for roast-heaps, while the low-grade ores are dumped at a place conveuient, to he started on their course through the concentrators. The high-grade ore is hroken into egg-sized pieces with 10-pound hammers, and carried hy cars to two rows of roast kilns, which are conncted hy a tunnel witb a large smokestack. The ore is placed in these kilns upon a layer of cotton wood in the hottom, a little wood being added occasionally as the kiln is being charged. When filled with ore and wood, it is covered over with finely screened ore, and the wood is fired at the bottom. Each kiln burns from four to five days, when the ore becomes sufficiently desulphurized, and is taken out. It is sometimes smoking in the center while it is being taken from the ends. Portions of the high-grade ore are taken to leveled places, where it is built into roast-heaps. This is done hy placing on the ground first a layer of wood; then a layer of ore is pitched on with strong pitchforks, which act as screens to separate the coarse from the fine. Air passages, filled with kindling-wood, are left in the heap, connecting with vertical drafts, made by binding together sticks of cordwood and piling ore about them. These air passages create a draft as the roast-heap is fired. When the heap reaches a hight of three or four feet, the fine ore lying ahout is shoveled on the top and sides to exclude the air, and the heap is fired. The wood takes fire, and readily communicates its fire to the sulphur in the pyritous ores. In the course of twelve hours the wood is nearly all consumed and the ore has settled down, hut the whole heap is burning evenly throughout, and sulphurous smoke is emitted steadily from the entire surface of the heap. These roast-heaps burn from four to six weeks, when the fire dies out, leaving the ore pretty well desulphurized and in a partially pulverized state. The iron in the ore has become well oxidized. The roasted ore from heap and kiln is then hauled to the reverberatory furnaces.

The low-grade ore passes through a process of concentration. In this work it is shoveled into a medium-sized rock-crusher, and from it goes into a coarse revolving screen, through which the finer particles pass freely into a chute, while the coarser parts pass over the screen and into a smaller rock-breaker, where they are re-crushed and afterward mingled with the finer pieces at the hottom of a helt-and-cup elevator. By this appliance the crushed ore is elevated to the upper part of the building, and discharged into a large, dry revolving screen, six feet in length. The first two-thirds of this screen is two and one-half to the linear inch; the remaining one-third, one-half mesh to the linear inch. Three separations of the ore take place here. The largest sized particles go to a set of 30-inch rolls, the next smaller to a set of 12-inch rolls, and the finest to the bottom of a short elevator, hy which it is carried to the first of a series of wet revolving screens. The coarser pieces, after heing re-crushed by the rollers mentioned, are also discharged into the wet revolving screens (each with jets of water thrown upon it from sides of longitudinal pipes), placed in the following order, according to which the sizing takes place—3½, 5, 8 and 13 mesh screens to the linear inch, and hydraulic sizing boxes follow. The screenings from the revolving screen above empty into the next below, and so on through the sizing boxes, and the slimes which are carried hy the water over the last sizing hox are settled in large tanks, afterward made into bricks, and smelted. From the various screens and sizing boxes each sized ore goes to its corresponding jig or Frue Vanner, where the ore is separated from its gangue, or sterile quartz, upon the principle of specific gravity, the light portions of the rock treated passing off with the water, while the parts heavily freighted with metal are saved. The concentrates which are saved from a very fair grade of ore are stored in hins, partially dried, and put through the calcine furnace, where 75 per cent of their suphur is oxidized and passes off as sulphurous fumes. The calcined concentrates were then taken to a place convenient to be charged in the reverberatory furnaces, where, it will he remembered, we left, in our description, the roasted high-grade ores. The charge for the reverheratory furnaces is then made up from kilu-roasted ore, heap-roasted ore, and calcined concentrates, with a few hundred pounds of raw screenings, when advisable. The slag or skum is skimmed off the molten mass within the furnaces at intervals of three or four hours, and a new charge added. The copper matte is tapped from the furnace every three or four charges. The company makes a good and steady grade of matte, assaying 65 per cent copper, which is shipped in stacks from the door of their matte house, in cars, to refineries in the East,

ENGINEERING NOTES.

Shaking Out the Curves.

The thing which stands before every railway company in the land is the adoption of stone ballast, heavier steel rails, lessened curves and more tracks, and a generally more substantial rolling stock and general equipment throughout. An exchange remarks that the Pennsylvania road is already duping this necessity. It is actively engaged in making substantial improvements on its main line and branches connecting therewith. Not only has the passenger business been very largely increased during the past few years, but the freight traffic has become almost a burden on the main stem. To accommodate this growing business it has been found necessary to shorten the distance between Philadelphia and Pittsburg. By straightening the lines, cutting curves off where possible and building new branches, much mileage has been saved.

The right of way for a fourth track has been secured on their eastern end as far as Coatesville, and the track has been laid almost to Wayne Station. Near Harrisburgh some important additions have been made to the company's facilities for handling freight. Purchases of land have been made, freight yards are being arranged, and at some places additonal tracks are being constructed. The improvement of the West Pennsylvania Division, which is intended to relieve in part the overcrowded Pittsburg Division and Pittsburg yards, by taking through traffic, is nearing completion. It involved the reduction of its maximum grade from 52 to 21 feet per mile. One of the most important pieces of work, the Salinas tunnel, is finished. It has probably the largest section of any tunnel in the world being 18 feet wide at springing line and 20½ feet above tie at center of tunnel. It is 1373.2 feet in length, two-thirds of which is on a six degree curve, the remainder on tangent. The tunnel headings, driveo from each end, met midway on the curved portion, and when the lines were produced through the aperture they struck within a half inch – practically exact.

RAILROAD BUILDINGS IN VENEZUELA. The first railroad built and operated in Venezuela began at Puerto Cabello and led to the westward. About ten miles were built and operated, but embarrassment followed, and nothing is now to be seen except a dim outline of the roadbed. About 1870, an English company built a two-foot gauge road from Tucacas to the mines of Aroa, a distance of fifty-five miles. Poisonous reptiles, wild animals, malaria and dense jungles combined to obstruct the building of the road. The largest bridge has a span of ninety feet. The ties, bridges, and even the telegraph poles are of iron. The road for its last five miles has a grade of 600 feet, requiring specially constructed engines. The freight can carry from five to six tons and the passenger cars about thirty passengers. A road from La Guira to Caracas, a distance of twenty-two miles, has been in process of construction for several years. The track of the road is three and one-half foot gauge. It is built on a series of reverse curves, having a radius of 140 feet. Surveys have been made for other lines, and a small amount of grading has been done on a road forty miles long from Puerto Cabello to Valencia.

ENGINEER ASSOCIATIONS.—The National Association of Stationary Engineers met early this month at Baltimore, in annual session. This organization is a new one, and is progressing slowly but steadily. It now has about sixty subordinate associations. This is one of the best and most useful among the many similar associations, and is one that should be encouraged by all using stationary steam power. It elevates the standing and improves the efficiency of stationary engineers and will most materially reduce the number of boiler explosions where "nobody is to blame," excepting those, who, for the sake of a petty and mistaken economy, employ cheap and inefficient engineers. The fact that a man is a member in good standing of an association of stationary engineers is a sufficient evidence of his ability to do his work economically, safely and industriously.

THE SEVERN TUNNEL is designed to give a direct line from Milford Haven, a splendid harbor on the extreme southwest point of the Welsh coast, to London. It will be about 4½ miles in length and of an average depth below the channel of 100 feet. A 7-foot tunnel has been run through the whole distance and now about 3,000 men are at work all along the line enlarging the opening to a diameter of 26 feet. It is believed that a line of steamers from the United States to Milford Haven, and thence by the Great Western railway to London will, when this tunnel is completed, make a route from this country to England much quicker than any other.

Two great engineering schemes are now attracting attention in Europe. One is a proposed railway tunnel through the Pyrenees, a convention for which has just been signed by the French and Spanish International Railway Commission. The other scheme is an international railway connecting Europe with Persia, India Burmah and China.

THE annual convention of the Locomotive Engineers of the United States and Canada will be held in B'nai Brith Hall, in this city, on the 1st of October, when it is expected that 250 delegates will put in an appearance.

USEFUL INFORMATION.

A Novel Device for Cooling Rooms.

A novel and somewhat curious apparatus is about to be placed in a German hotel for the generation and diffusion throughout the hotel of ozonized air. It will be connected with a special system of ventilation which will be properly arranged throughout the structure. The air to be ozonized is passed, by means of a fan driven by a water engine, through a chamber or generator, within which is a series of fifty glass plates fixed close together and coated with tinfoil strips so as to constitute metallic gratings, and across the interstices of these gratings the discharge of a large Ruhmkorff induction coil is passed in a multitude of little sparks. The induction coil is one of high insulation and capable of giving a spark in air between its terminals of fifteen inches. Under the system of ventilation adopted at this enterprising hotel, the ozonized air is conveyed to the large salons and the theater, and is not only warmed to the required temperature, but is charged with aqueous vapor so as to maintain the saturation corresponding to that temperature at a healthy degree of humidity. By means of suitable valves, air properly warmed and charged with aqueous vapor and ozone can be turned into any room at the rate of from 2,000 to 3,500 cubic feet per hour for each individual.

DRY-ROT IN TIMBER. A remedy has been discovered, says the *Mechanical World*, by the use of which this destructive enemy to the woodwork of a house may be destroyed or arrested. What is known as "dry-rot" is caused by the spores of a species of fungus (the *Merulius lacrymans*), which, though they are sometimes carried by currents of air to the scene of their future devastations, are more frequently present in the soil upon which the house is built at the time of erection, and are brought into near contract with the woodwork in the filling up between the joists, or sometimes even in the mortar. Notwithstanding its name, dry-rot does not act upon perfectly dry timber, but begins it ravages whenever the wood is in the necessary state of humidity. It may be prevented by mixing with the rubbish used for filling in the floors the "tank waste" from alkali works, or the same substance will completely check it if already developed. Tank waste is of no commercial value, and may be had at alkali works for fetching: it wholly destroys this species of vegetable life, and generates no bad smell whatever.

A NEW APPLICATION OF PAPER.—William J. Griffin, of the Holyoke envelope works, has invented and patented a new application of paper. It is designed as a substitute for wood in blocks or bars wherever a knife is used in a mechanical cutter. In the shape of bars, it has been put into every paper mill in town where an undercut cutter is used. The Whiting, Albion, Winona, Nonotuck, Massasoit and other mills have it. The invention is also applied to blocks for shoe cutting and cigar making. At the Holyoke envelope works it is used in the cutting blocks in the envelope cutters. One outlasts a dozen of the formerly-used wooden blocks. In its manufacture, sheets of paper are compressed by enormous force into blocks or bars, as wished, harder than wood and far more durable. Mr. Griffin has just received his patents on the invention and will now introduce them outside of Holyoke.—*Holyoke Transcript.*

WOODEN CARPETS.—What is described as a wood carpet has lately been patented by Herren Kuny & Mark of Munich, says the London *Furniture Gazette*. It consists of prepared wood fiber, felted by the aid of oxidized linseed oil and coloring matter on to a jute fabric, the back of which latter is covered with a coat of varnish. The material thus obtained is said to have a pleasing appearance, can be easily cleaned and repaired, is warm, noiseless, and can be taken up like carpets and quickly relaid on a change of residence. The surface can be produced either flat or with designs in very slight relief. The coloring is homogeneous throughout. As will be seen from the above description, the wood carpet is in some respects not unlike our linoleum. The price is said to be, however, much lower, while durability is also claimed for the new material.

STOCKINGS IN OLDEN TIMES.—Two centuries ago not one person in a thousand, probably, wore stockings; and now scarcely one person in a thousand is without them. The honor of inventing the first stocking machine belongs to William Lee, an English clergyman, who made a pair of hose by the frame, in the presence of King James I. But such was the prejudice of those times that his invention was frowned upon, and he went to France. Here he met with no better success, and died in Paris, in great poverty, of a broken heart. His machine, however, won its way, and was in general use for two and a half centuries. It is now superseded by a beautiful piece of mechanism, called the circular hosiery machine. One girl attending upon its revolutions can produce material in a single day for 240 pairs of stockings.

IRON AND ALUMINUM.—Iron is now rendered highly ornamental by coating it with aluminum, in the same way as iron plates are now tinned and converted into tin plates. This process is due to the ingenuity of Dr. Gehring, of Germany, who uses for the purpose a Bunsen burner with a blast or a muffle, and is thus able to manufacture various articles of the durable metal for daily use, the coating of aluminum giving them a silver-white luster. He also produces a gold luster, or any other color, and even an enamel coating, all of which substances are said to adhere very firmly to aluminum. The latter, as is well known, does not oxidize under normal conditions, and even stands the heat of an ordinary fire, while it is much more lustrous than tin.

PERFORATIONS IN WOOL FIBER.—Joseph M. Wade has been making some microscopic investigations in regard to wool which will be of interest to growers and purchasers of that staple. In a recent letter to *Science* he says: "In my investigations in wool fiber I have found some defective hairs that were perforated in places, evidently while growing on the sheep's back. As the perforations are perfectly circular, it would indicate that they are made by some creature at present unknown. Would it not be worth tho while of some of your scientific readers to examine into the matter, and discover, if possible, what the perforator may be, and whether it is likely to remain as little injurious as at present?"

BRONZING PLASTER OF PARIS.—A very brilliant bronzing is done with the cuttings of gold-beater's foil, ground under a muller with honey. The object to be bronzed is coated with linseed oil, and the metallic powder is applied upon it with a rag. This recipe is given in the *Oil and Colorman's Journal*, and may be used on wood, paper or pasteboard, as well as plaster. Mosaic gold may be employed for the same purpose, after having been finely ground with six parts of calcined bones. A small quantity of this mixture is taken upon a wet cloth and applied upon the object. The bronze coat is then rubbed with a dry rag, and afterwards burnished.

IMPORTANCE OF LITTLE THINGS.—A London builder was offered bricks one-eighth of an inch below the regular thickness. "What matters an eighth of an inch in a brick?" said the merchant. "It matters 3,000 more bricks for my job," was the reply. In an establishment employing 50 hands a loss of one minute each time of ringing the bell means 1.5 hours a week; this shows the value of trifles.

A BARREL OF FLOUR.—The cost of the barrel is 35 to 40 cents. It ordinarily requires from 30 to 40 pounds of coal to drive the machinery to make a barrel of flour. Four bushels and 40 pounds of wheat, or 275 pounds in all, are required to produce a barrel; or 196 pounds of good flour; bran and screenings, 69 pounds; loss not accounted for, 10 pounds.

MAN POWER.—A recent calculation shows that a man weighing 160 pounds and running a mile in six minutes performs work about equal to that of a half-horse engine; while a walker sustaining five miles an hour for a long day does work equal to that of a quarter-horse engine, and consumes only one-twentieth of the weight of food or fuel.

A SPECIES OF RICE has been discovered in Mantchuria which can be cultivated without irrigation, and consequently without risk to the health of the district. Whether it is equally productive with the common species remains an open question.

IT takes 250 bushels of potatoes to produce a ton of starch.

GOOD HEALTH.

The Fly a Dangerous Insect.

It has long been known that the common house fly sometimes acts as a carrier of infection by means of contagious matter attached to its feet and wings; but according to the *British Medical Journal* the fly also possesses a peculiar fondness for devouring the minute eggs of various worms, some of which are parasitic in the human body. These eggs they deposit in their faeces in all sorts of places, infecting our food and drink in a most reckless manner. The following is an account of some experiments which substantiate the fact:

Dr. Grass, of London, is said to have made an important and by no means pleasant discovery in regard to this matter. He exposed in his laboratory a plate containing a great number of eggs of a human parasite, and some sheets of white paper were placed in the kitchen, near the laboratory. After some hours the usual spots produced by the faeces of flies were found on the paper. These spots, when examined under the microscope, were found to contain some of the eggs of the human parasite exposed upon the plate. Some of the flies were then caught, and their intestines presented large numbers of the ova. Other similar experiments with other ova were made with corresponding results.

Dr. G. mentions an innocuous and yet conclusive experiment that everyone can try. Sprinkle a little lycopodium on sweetened water, and afterwards examine the faeces and intestines of the flies which visit it. Numerous spores will be found.

As flies are by no means particular in choosing either a place to feed or a place to defecate, often selecting meat or food for the purpose, a somewhat alarming vision of possible consequences is raised. Dr. G. invites the attention of naturalists to the subject, and hopes that some effectual means for destroying flies may be discovered.

HAY FEVER.—This is the period for hay fever, a malady from which many suffer, and which admits of few methods of relief not embodying change of altitude or climate. Dr. W. T. Phillips, of Andover, recommends belladonna –one and one-fourth minims of the succus every hour until relieved (30 m. to 3 ounces of water, teaspoonful dose). Dr. G. E. Dobbson, in the *Lancet*, has had satisfactory success by the inhalation of the vapor of camphor and steam, made to come in contact with the outer surface of the face about the nose by means of a paper cone, placed with the large end downward in a vessel containing hot water and a drachm of coarsely-powdered or shredded camphor. He asserts most positively that if this procedure is continued for 20 minutes, and repeated 3 or 4 times in as many hours, great and and usually permanent relief follows.

FOR WARTS AND TUMORS.—A painless caustic for the removal of warts and tumors may be made as follows:

Arsenous acid	1 part.
Sulphate of morphine	1 "
Calomel	8 parts.
Powdered gum arabic	48 "

This is to be sprinkled over the cuticle daily, the surface of which has been previously denuded by knife or blister.

Cauquoin's paste for the same purpose is composed of ten parts of chloride of zinc, two parts of alcohol (60°), and fifteen parts of wheat flour. The zinc in fine is added to the alcohol, then incorporated with the flour in a mortar, strongly pressing with the pestle. As soon as homogeneous it is spread with a roller into sheets an eighth of an inch thick, and after a few hours put into a well-corked bottle.

Latour's nitrochloride of zinc paste is also an excellent preparation, and is made by dissolving fifty parts of the chloride and one hundred parts of the nitrate of zinc in eighty parts of water. The solution is made by the aid of heat. When it cools, seventy-five parts of wheat flour is incorporated with one hundred parts of the solution, as with Cauquoin's paste.

ROUND SHOULDERS.—If your occupation is such as to produce bent and stooping shoulders, unless precautions are taken to correct the tendency you should make use of means for that purpose. When out-of-doors and not at the desk, straighten up, throw back the shoulders as far as possible, breathe deeply, walk rapidly, and wear, if you think necessary, braces properly adjusted. Some one suggests a mode of exercise as helpful in correcting the tendency to stoop, to wit: Hook the fingers of the hands together, and raise the elbows as high as the shoulders and pull strongly. By doing this frequently, the muscles of the shoulder-blades are strengthened, and thus serve to keep the shoulders in normal condition. Lie down on the back and raise the chest a few times, by pressure of the head against the cushion or pillow on which it is resting. This exercise will strengthen the muscles of the neck, and give it more steadiness in the erect posture.

INFECTED BY A PARROT.—Our correspondent, Mr. Henry Noble, of Turin, Italy, sends the *Herald of Health* the following peculiar item: "About a year ago, the Fueter family of Oberbalm were destroyed by a contagious breast disease, the origin of which was traced to a sick parrot. With the extinction of that family the inheritance passed to certain distant relatives of Franenfeld, and among the things which were inherited was the parrot. After the lapse of a few months four members of the Franenfeld household became ill, and the parrot died. As the cause of the infection was known, the body of the bird was sent to the Museum of Natural History at Berne for an examination. A Dr. Grimm, an assistant there, became ill shortly afterward, being struck by a serious breast complaint. All the medical force are now studying the strange case."

KILLED BY A LIGHTNING BUG.—A strange death of a little girl by accidentally swallowing a lightning bug is reported from Concord, Worcester county, Md. The child was playing in the yard with a number of other children at her parents' house, near Odell's factory, and while laughing and romping about, a lightning bug flew into her mouth and made its way down her throat. The little girl became suddenly ill, and though physicians did everything to relieve her sufferings, she died within a few hours afterward. This is the first death from such a cause on record.

SEA-BATHING.—Why, in sea-bathing, is the water warm when the wind is from the sea toward the shore? An old salt says that the answer is simple enough. When the wind is from the sea the surface water people bathe in, which is warm, is blown and held in shore; when the wind is off shore the surface water is blown out, and cold water from the depths below the surface takes its place.

DECAYED TEETH.—Professor Busch of Berlin holds that caries of teeth is peculiar to man, never having been observed in any animal. It is more prevalent among some races than others, and seems to affect the whole race. In this respect prehistoric man had no advantage,

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

QUARTZ.—Amador *Ledger*, Sept. 20: We were shown last Saturday a sample of quartz taken recently from the Iowa mine at Sutter Creek. It was small in size, weighing only a few ounces, but it was one of the richest specimens we have even seen in the county. It was literally covered with free gold. The value of such ore would run up into the thousands of dollars per ton. The seam of this rich ore, however, is very narrow, not averaging more than a couple of inches in thickness. It is free milling rock, containing no base metals worth speaking of. The Iowa is looking well in every respect, and continues to pay handsomely. The Middle Bar tunnel is in about 1400 ft.

SUTTER CREEK.—Sinkingat the Eureka has commenced in earnest. An eight-hour shift force has been put on, and the shaft is to be sunk to the depth of at least 200 ft with all possible dispatch. The shaft will be sunk by the side of the ledge, consequently no developments of any importance are looked for until sinking is completed. The usual force is working at the Lincoln. The ore pays something over expenses, and 20 stamps of the mill are kept going. At the Downs claim, north of the Lincoln, everything is progressing favorably. They have reached a depth of about 100 ft. Good rock has been encountered, which is accumulating on the dump until they have sufficient to start milling. A clean-up was made at the Iowa this month, which yielded at the rate of $85 per ton.

Inyo.

DARWIN.—Inyo *Independent*, Sept. 27: In Darwin Mr. J. C. Eddy is doing a good deal of work. Not long since after a run of 14 days with 5 stamps he cleaned up $9,000. The bullion contained gold and silver. Mr. Eddy some time since leased the Revenue mine from Robert Mitchell; he has had men steadily at work there since and now has a good deal of ore in sight. The veins run from 6 inches to 2 ft in width and is all milling ore. The best quality contains $300 per ton. Mr. Eddy says that in Snow's canyon there are thousands of tons of ore that contain not less than $20 per ton. Some weeks ago a shipment of ore was made that netted $272.50 per ton in San Francisco. In the Silver Mountain mine at Old Coso, Mr. Eddy has a number of men at work. There are now 300 tons of ore on the dump. The ore from this region was formerly hauled to mill at Olancha, but as there is plenty of timber on the ground and much ore in sight Mr. Eddy thinks seriously of putting up a mill at the mine.

HUNTER'S CANYON.—Hunter's canyon, on the east side of the range, Beveridge district, still displays the beautiful ways of the olden time. Messrs. Thomas McDonough and W. C. Kisling own and run a little 36-inch pan in Arastra ravine. The miners bring their ore in little dabs, "chiquacas," the quantities ranging from 20 pounds to a ton. The ore is worked and the bullion handed to the owner, who has in most instances sat around waiting for the completion of the operation. No ore of less value than $50 per ton will be touched by the miners, many of their "chiquacas" running away up into the hundreds of dollars per ton. This ore is all gold bearing. Messrs. McDonough and Kisling are now extending their works by putting in a new 28-ft wheel; the present wheel is but 12 ft in diameter. The new wheel will work two pans and a small battery of stamps. The miners do not tie themselves down to steady drudgery; a few days work, a few "chiquacas" of rich ore, a trip to the pan, a chunk of bullion, a trip to Lone Pine or Independence, continued until the proceeds are spent, and then back to the mine. Energetic work and modern methods would work wonders in Hunter's canyon.

CERRO GORDO.—Pat Clinton and others made a shipment of ore last week from Cerro Gordo to San Francisco. The ore will net the owners about $200 per ton. Mr. Crap, in the same locality, has a large quantity of ore ready for shipment. All of this ore is within about 8 miles of the railroad and costs $15 to ship. Four years ago ore shipped by wagon to Mohave, and thence by rail to San Francisco, cost $00 per ton. This great reduction of expense will bring into market vast bodies of ore that formerly could not be handled at all. John Thomas, an old resident of Inyo, returned from Arizona to Cerro Gordo a few months ago and resumed work on an old claim. In the Ignacio mine, one of the Cerro Gordo group, good developments have been made recently and a large amount of ore is now in sight.

KEELER.—About 20 tons of valuable ore was shipped from Keeler to San Francisco last Monday. Four gold bricks were shipped from Keeler by express last Monday. The total value of the shipment was not stated, but it will be a large sum.

BLUE BELL.—The Blue Bell is in the Inyo range, east of the Polita. The mine belongs to Peter Laird, and is one of many claims located in the same region. That whole district is only beginning to be prospected, and already there is evidence enough that it contains many valuable ledges. Mr. Laird has a lot of ore now ready for shipments to the Etna furnace. Samples of this ore give an assay value of $100 to $190 per ton. The ore must be packed two and a half miles, and hauled 10 miles to the railroad.

FREEBORN CANYON.—M. G. Nixon made a shipment of gold bullion from Freeborn canyon last Wednesday. The mine is now looking better than ever, and all concerned are well pleased with the outlook.

Mariposa.

MINING PROSPECT.—Mariposa *Gazette*, Sept. 27: Judging from what we can learn, which is from a pretty reliable source, it will be but a short time before Mr. Huling will arrive from the East to take into consideration the advancement of the mining property, known as the Yosemite Mill and group of quartz mines, which includes the No. 9,. Pool, Mt. Gaines and other valuable veins. The present indications are, Mr. Huling is endeavoring to carry out his grand mining scheme, which has been published under the head of the "Mariposa Improvement Company," by the aid of an Eastern company, and that upon his return here he will be accompanied by some parties, whose business it will be to inspect the premises and report, or to immediately push forward the work upon the basis, adopted by Mr. Huling before going East. Other similar enterprises most favorably located will move whenever the success of Mr. Huling's enterprise is once assured. The Merced river passes through the center of a vast mining region of valuable quartz veins for 30 miles or more and its great water power and mill sites all along its banks will yet become valuable and be eagerly sought after, for crushing quartz rock and milling purposes.

Mono.

STANDARD CON.—Bodie *Free Press*, Sept. 29: They extracted and shipped to the mill 506 tons of ore, also worked 750 tons of tailings. Received from the ore 825 ounces of crude bullion and from the tailings 362 ounces. Have shipped to the company this day $15,846.22, of which $10,355.42 is from two weeks' run on ore and $5,490.80 is from two weeks' run on tailings.

BODIE CON.—At the mine 190 tons of tailings were worked, the average assay value being $6 per ton. At the mine the west cross-cut, 200 level, is in 65 ft. The east cross-cut, 300 level, is in 33 ft.

MONO.—The winze below the 600 level is down 13 ft. The ore in the winze has improved both in quantity and quality. They have commenced to extend the south drift, 550 (Lent shaft) level, into Mono ground.

CLOSED.—Bodie *Free Press*, Sept. 24: The Great Sierra Consolidated Silver Company has decided to close down its works for the season and possibly forever. The tunnel site will be guarded by Redlingshaler, the mail carrier.

Placer.

MINING AT COLFAX.—*Herald*, Sept. 27: We are informed that Wm. Werry, formerly superintendent of the Rising Sun mine at Colfax, along with Geo. W. Grayson and A. Borland, of Oakland, have relocated the old Rising Sun and propose to work it in connection with the Big Tree mine, a parallel vein. The work is under the superintendency of Mr. Werry, who has taken up his quarters at the Rising Sun office. On the Big Tree they have a shaft down 50 ft and the ledge is large and shows good ore. They have commenced timbering the shaft preparatory for hoisting. They expect to take out ore enough soon to run the Rising Sun mill steadily. Quite a force of men are at work and they are making room for more, and when this new enterprise gets fully under headway the good old times experienced at Colfax during the paying days of the Rising Sun are expected to return.

Plumas.

FROM EAST BRANCH.—Plumas *National*, Sept. 20: We are indebted to Mr. F. B. Whiting for the following mining notes from the East Branch:

RICH BAR.—Messrs. Scott & McDougall are taking the necessary steps to obtain a patent to their claim on this Bar. All that seems to be needed to make this a first-class placer claim, is to introduce hydraulic power, elevator, &c.

INDIAN HILL.—The hydraulic mine being worked here by the present owners, Lazier & Co., has been successfully worked for 30 years. The present year's operations extended high up the ridge, and the character of the gold extracted establishes the fact of the close proximity of a rich quartz ledge, the gold being very coarse and accompanied with much quartz rock. This claim promises many years of successful mining. In early days it was worked by the late Dewitt Kellogg.

INDIAN BAR.—Messrs. Keep, Ballou & Carr, having stripped a large amount of ground on the lower end of this Bar, are now engaged in cleaning up the gravel next to the bed-rock.

JUNCTION BAR.—Mr. G. L. Mori has opened a very fine hydraulic claim on this Bar, and the prospects obtained warrant the conclusion that when he gets an elevator to work he will have an excellent paying mine for many years to come.

WILLOW BAR.—Judge Lott, whose line canal conducts the waters of Yellow creek to the North fork near Junction Bar, is engaged in successful hydraulic mining on Willow Bar. The elevator used there proves invaluable. In addition to this mining property, his boys have recently developed a very rich gravel deposit in the ridge back of Willow Bar, which appears to those who have examined the ground, that a good hydraulic mine will be opened there in the near future. The prospect obtained was astonishing to those who had the work in charge.

LONG BAR.—Messrs. Thomes, Gamble & Co., on this Bar, are doing good work in driving a bed-rock tunnel to cut into and drain the back channel, where it is known rich gravel has been found. This will no doubt prove a fine paying claim when the present undertaking shall have been completed. Robt. Workman also mining on this Bar, is still actively engaged in cleaning up the large area of ground hydrauliced the present season, with flattering prospects for a good season's reward.

HOPKINS CREEK.—We learn from Mr. Donahue that his quartz locations on Hopkins and Poormans creek are prospecting well, and everything looks favorable for a paying mine in the near future. He has had assays made, and the returns show 45 dollar rock, and there is plenty of it. Mr. Donahue is interested in four different quartz claims and is at work on all of them. He also informs us that Mr. D. R. Thomas has commenced a tunnel to tap a gravel bed supposed to be a break from the celebrated North American claim, near Whiskey Diggings. Mr. Plumas Turner, of the Red Slide mine, at the head of Poormans, is pushing his tunnel along as fast as possible having advertised to let a contract to run 400 ft more.

HOHAWK.—Mr. Hapgood, of Mohawk, was in town attending the convention, and reports the Hawkeye quartz mine, in which he is interested, as paying six dollars per ton by arastra process, and that he will have a Huntington improved mill ready to run in four weeks, when he expects to report some good clean-ups.

GREEN MOUNTAIN.—Greenville *Bulletin*, Sept. 27: The two blind drifts run east from No. 1 raise in the Beake chute, have been extended to the east line of the pay; 2nd, with exception of No. 2 raise, which is being pushed ahead as fast as possible between Nos. 2 and 3 drifts and between No. 3 drift and No. 5 level, all work is confined to stopes. The rock continues very hard yet, but the quality of the quartz is first class. The air drills have been taken from the No. 3 blind drift, and after a few needed repairs, were started up in the face of No. 6 tunnel on the 16th inst, and work will be continued here steadily till the sulphuret chute is reached, a distance of about 300 ft. Everything about the mill is running smoothly and well.

San Bernardino.

GOLCONDA.—Calico *Print*, Sept. 27: Last Sunday Mrs. A. K. Townsend returned from San Francisco, accompanied by Mr. G. W. Rogers, a metallurgist and mining expert. Mrs. Townsend was present at a meeting of the Directors of the company held for the purpose of considering the report of one Grant Rhodes, who recently made a few imperfect assays of low-grade ore in the Golconda mine, and who made an unfavorable verbal report before the Directors. The majority of the Directors were in favor of accepting the report of G. W. Strong, one of the Strong Bros., who have sampling works in San Francisco and are well known all over the coast for their skill and reliability in mining matters. A short time ago Mr. Strong thoroughly examined the Golconda mine, and made numerous tests of the ore in many places in and on the mine, besides taking 800 pounds of average ore, carefully sampled, to San Francisco and making a milling test of the same, extracting $54 which would be an average of $135 to the ton. The management of the mines has been given to Mrs. Townsend for the next ninety days. She will proceed to develop the property, and when sufficient ore has been taken out to guarantee the erection of a mill, it will be done near their well that is being sunk.

RICHMOND AND LOOKOUT.—In company with Jas. McGlinchy we carefully examined the Richmond mine, adjoining the Snowbird and Cuba, and were quite favorably impressed with the prospects. There has not been much work accomplished, but what has been done shows that an abundance of mineral can be taken out from the surface, and also from a considerable depth. Numerous spar seams can be traced for several hundred ft east and west, which bear mineral. These veins or seams seem to thread through a ledge of ore that extends the entire length of the claim, and can be traced through the Lookout that adjoins the Richmond on the west. Numerous prospect holes have been made along this ledge on the surface, from which ore has been taken, some pieces being covered with horn silver. There is every indication of an immense quantity of ore in this mine. The extent and richness of the same cannot, of course, be accurately ascertained until the mine is properly developed.

SAM HOUSTON NO. 3.—R. B. Johnson, the lessee and part owner of the Sam Houston No. 3, and Blackfoot, has sub-leased portions of these claims to other parties. He has given leases to three companies of chloriders on the Sam Houston No. 3. On the south side of the mine S. W. Fulton and Tom Preston have run an incline in about 25 ft, and are taking out ore of a fair grade. They have a good prospect.

BLACKFOOT.—Mr. Johnson, with a couple of men, is sinking an incline in the southeast end of the Blackfoot. They are in about 30 ft and the depth is about 30 ft. Their showing is very good, 4½ tons of ore have been milled and 2 tons are on the dump. The returns were quite satisfactory. E. Burch, Dan Wise and John Malone are working on a sub-lease in and near the old incline on the Blackfoot. They have shipped 7 tons of ore to the mill which will return about $150 to the ton in bullion. Several tons are on the dump that assay about $500 to the ton. Malone is working in a new incline, which is in about 25 ft, with ore in sight. Wise is working in the old incline and following up an ore streak quite rich in spots. Burch is working in another claim, the Josephine. Fred Heber and Peter Nichols have commenced operations on the Continental mine.

Sierra.

NEW ARASTRA.—*Mountain Messenger*, Sept. 27: S. D. & H.D. Hill are now engaged in building a new arastra on what is known as the brick yard, on the bench south of town. With this machine it is proposed to work the quartz on the Oro ledge, with which property Mr. Hill has been familiar for the past quarter of a century. The arastra will be a large one, 15 ft in diameter, and will be driven by a combined overshot and impact wheel, arranged after a manner of Mr. Hill's invention. He proposes to bring the water to his wheel, which will be 30 ft in diameter, in pipes under a head of 150 ft. Around the periphery of this wheel will be arranged suitable buckets to receive the impact of the water; the arrangement is such that after the water has exerted the force due to the head, it will fall into the buckets of the wheel, thus utilizing its weight as well as its velocity. The main object of this peculiar arrangement is to overcome a disadvantage due to a variable head of water. The water comes from Slug canyon and is owned by Mr. Hill. During part of the year there is only a small head, not enough to drive either an overshot or percussion wheel, but by combining and utilizing both the velocity and the weight of the water, he thinks he will have power enough to drive his arastra during the lowest water that will occur in any ordinary season. During times of flush water he will use his wheel simply as an overshot. He proposes to work first the ore now on the dump of the Oro mine—rock which he knows will pay for working and next, rock from the tunnel, which he has thoroughly prospected and knows the value of, having worked the upper levels years since in an arastra similar to the one he is now building. He concludes that with the power at his disposal he can work at least five tons per day. He has under consideration, also, the putting up of one of Mr. Forbes' new crushing machines, and ultimately the creation of an 8 or 10-stamp mill. Now that a start has been made, we expect to see other mills being put up at no distant day to work the ores of this section, which are almost unlimited in amount and more easily developed than in any section of the State, owing to the precipitous character of the hills in which they lie. Mr. Hill has made an arrangement with the Oro Company, a corporation, by which he secures the right to mine and work the company's rock upon advantageous terms, and for a length of time which he deems sufficient.

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, Sept. 27: Good headway is being made in the main north drift, now turned a few points to the west. It is passing through a selvage of quartz that lies on the east side of the ore vein. This quartz has of late considerably improved in appearance. The winze below the 2800 level is making good headway. The quartz mentioned recently as having been encountered at the bottom of the winze now appears to be passing out on the east side, and clay is making its appearance on the west. On passing through this clay it is thought that the same quartz will be found that was had above on the 2800 level.

OPHIR.—Some ore is still being extracted from the fillings of the old drifts on the 250 level. The west drift on the 500 level is being advanced at the rate of about 70 ft per week, and the south drift on the 1500 level at the rate of over 60 ft per week. On the 3200 level the joint Mexican, Sierra Nevada and Union Con. winze is down a sufficient distance below the 3300 level to make a sump. The work now in hand is the cutting out of a station, when a west cross-cut will be run on the 3300 level.

SAVAGE.—Good headway is making in the main drift on the 2800 level of the Hale and Norcross, which drift is being pushed for the Savage south line. The new tunnel which is being driven in to tap the 200 level and open the northern extension of the ore body now being worked further south in the Hale and Norcross, is in a little over 50 ft. It is in ground that works very well, and is being pushed forward as rapidly as possible.

ALPHA.—Good headway is making in the upraise from the 600 to the 500 level. It is following the large and promising body of quartz found on the 600 level. At the 500 level this body of quartz will be thoroughly explored by means of cross-cuts. The west cross-cut on the 600 level in Alpha ground is showing up quartz that gives very promising assays.

SIERRA NEVADA.—Are repairing the winze connecting the 2300 and 2400 levels.

BEST AND BELCHER.—The north lateral drift on the 825 level is now in a hard, dry porphyry. It is, however, being advanced 50 ft per week. On the 2500 level the joint Gould and Curry west cross-cut is cutting through quartz, clay and porphyry. The quartz is of fair appearance, but carries very little metal.

ALTA.—The main northeast drift on the 2150 level is making good progress and will soon reach the ore vein. The branch drift into Benton ground is being pushed as rapidly as possible, and will reach the ore vein about the same time as will the Alta drift. Not much water is now encountered.

CROWN POINT.—A considerable amount of ore is being extracted and sent to the mills on the river, and the usual prospecting work is being carried on. The mills on the Carson river are not now being run to their full capacity, owing to the low water.

COMBINATION SHAFT.—Rapid work is being done in the sinking of this shaft. It is now within 20 ft of the 3000 level. In case all shall go well and smoothly the 3000 level will be reached next Monday or Tuesday.

BELCHER.—A sufficient amount of ore is still being found to keep the mills on the Carson river at work, though, owing to a decrease in the volume of water, they cannot be run to their full capacity.

BENTON.—Good progress is being made in the branch drift from the Alta into the Benton ground. It will reach the vein in a few days. There is no trouble on account of water.

YELLOW JACKET.—The old upper levels are still yielding a considerable amount of low-grade ore, and the prospecting drifts are prospecting a favorable appearance.

UTAH.—The southeast drift on the 1750 level is still in hard porphyry, yet very good headway is being made. There is no trouble with water.

GOULD AND CURRY.—Most of the work in this mine is joint with the Best and Belcher, and the reader is referred to the report on operations in that mine.

ANDES.—Some low-grade ore is being extracted, and a good deal of prospecting is being done in deposits of quartz that are mineral-bearing.

CON. VIRGINIA AND CALIFORNIA.—The northwest drift on the 1700 level is making good headway and is in material of a very favorable appearance.

Belmont District.

BELMONT.—*Courier*, Sept. 20: Under stopes Nos. 2 and 3 have improved during the week. Upper stope No. 1 has widened at its south end to 8 ft. We are extracting more ore than the mill can handle; grade of ore constantly improving. Mill has lost three days this week for want of supplies; expecting a supply by Sunday. Shipped 2 bars Wednesday; value, $3,873.67.

Columbus District

A PROMISING PROSPECT.—*True Fissure*, Sept. 27: There are many people, directly and indirectly, interested in the welfare of this town and its nearest neighbor, Pick-handle gulch, who have been watching and waiting the expiration of the time of redemption of the Northern Belle property. The slow moving, especially so when one is waiting, cycle of time has brought around the day, and the property of the once famous Northern Belle will be known by that name no more, it having passed into the possession of the Holmes Company, the largest mining company, with its new acquisitions, that has ever existed in this district. And true to the predictions of its managers, work will again be resumed within the following two weeks. It is proposed to put 50 men at work in the mines of the company within that time and increase the number as fast as the developments warrant it. The work will not be confined to the mines alone, but the mills at Belleville will receive a complete overhauling and will be put in a perfect state of repair. The brick smoke-stack at the upper mill is to be taken down and rebuilt in a perpendicular position, besides the necessary improvements will be prosecuted at the same time. In consequence a very appreciative smile now illuminates the faces of the merchants and all others interested in the welfare of this community and its prospects for the future. It is no idle boast that

there is plenty of mineral in the Columbus mining district, a fact that has been proven in days gone by, and there is plenty of unprospected ground that there is every reason to expect good reports from when it has been opened. Not a little of this promising country is within the boundary lines of the Holmes Company, all of which can be more readily worked from the lower levels of the old Northern Belle. But with all the brightening skies for the future welfare of the camp, a rush of people here is not desirable nor commendable.

Galena District.

THE MINES. *Messenger*, Sept. 26: The Galena mines are looking splendidly, and everybody is at work and making money. B. F. Wilson will start up the White & Shiloh mine shortly. He has enough ore in sight in the Trinity mine to run the mill a year. Andy and Charley Melander have out a carload of first-class ore for shipment; their mine looks well. Blossom has several men at work on the Temby mine, which is producing good ore. Driscoll has the best showing of galena ore in the Honora O'Neal mine to be seen in the State.

Jackrabbit District.

CLOSED DOWN.—Pioche *Record*, Sept. 20: The Day mine at Royal City has been closed down for the present, and all hands discharged, owing to the low-grade of the ore. The Mendha mine at Highland continues working a full force of men, both in extracting ore and prospecting. The mine is looking fine and the allotted amount of ore is being extracted and shipped to the furnace daily.

Rebel Creek District.

OHIO MINE ORE.—*Silver State*, Sept. 26: Yesterday W. B. Todhunter's team arrived here with 24,000 pounds of ore from the Ohio mine, in Rebel Creek district. This ore is worth from $300 to $600 per ton, and it is intended for shipment to Salt Lake City.

Tuscarora District.

GRAND PRIZE.—*Times Review*, Sept. 19: South drift on the 400-ft level has been extended 22 ft during the week. Stopes are producing sufficient ore to keep the mill running.

ARGENTA.—South cross-cut in the 400 ft level is in 206 ft. Ground is beginning to get a little softer.

GRAND PRIZE.—*Times Review*, Sept. 25: South drift in the 400-ft level has been extended 20 ft during the week. Stopes are producing sufficient ore to keep the mill running.

ARGENTA.—South cross-cut in the 400-ft level has been advanced 6 ft during the week. Ground is more favorable. Considerable water is coming in in the face of cross-cut.

BELLE ISLE. North drift, 150-ft level, has been extended 7 ft; total length, 51 ft. Line upraise, 250-ft level, has been carried up 79 ft.

NAVAJO.—South drift from No. 2 cross-cut, 150-ft level, has been extended the past week 19 ft, developing a width of 1 to 3½ ft of high-grade ore. Winze in north drift from same cross-cut has been sunk 8 ft; total depth, 70 ft. No material change at this point. South drift from line cross-cut advanced 9 ft; total length, 81 ft. The vein retains its usual width and grade of ore. South drift on the 250-ft level has yielded a good quantity and grade of ore the past week. The face shows a width of 2 ft of high-grade ore; progress, 12 ft. A better grade of ore has been sent to the mill the past week. The stopes are looking well at all points.

ARIZONA.

ANOTHER RICH STRIKE.—Tombstone *Epitaph*, Sept. 27: Supt. H. T. Fisher reports a rich strike made in the Ground Hog mine last week. In running a drift from the 200-ft level, the workman struck the ledge, about a hundred feet from the main shaft, it proving to be about 7 ft thick, none of it being of lower grade than 50 ounces to the ton, and containing a streak, about 2½ ft wide, of ore running from 150 to 300 ounces. The workmen have since been engaged in mining the streak. Mr. Fisher states that with present facilities it does not pay to take out ore running less than 60 or 70 ounces. There is now on the dump fully 300 tons of ore running from 40 to 50 ounces. This ore will net about $10 per ton to the company, but the superintendent thinks he can do better with it in future than disposing of it at that rate. Next week Mr. Fisher will ship two car-loads of ore, of about 15 tons each, to Socorro or Pueblo, one car of which will run 150 and the other 300 ounces to the ton.

DULL TIMES AT QUIJOTOA.—Cor. *Sunshine and Silver*, Sept. 27: The company intend, next March, to send down an old 20-stamp mill from the Comstock. They are not yet quite sure whether what ore they have is a mining or a milling proposition, but they won't be out much on this mill anyway, as it is idle, and a trifle the worse for wear. Should they not find any more ore in the mountain, they will, as soon as they have connected the tunnels with the surface, start in to work what is on top. It is rather a come-down from our dreams of extensive reduction works and a young Virginia City to an old 20-stamp mill, but then we have discounted our disappointment and realized that a company cannot find more than is in the ground, even when they have the moral support of the Nevada bank. We want you to impress upon outsiders the fact that this camp does not depend solely on the outcome of the Ben Nevis mines. The exaggerated blowing about these mines has cast outside properties in the shade, but they are here nevertheless. The neighborhood of Covered Wells gives great promise as a good "chloriding" or poor man's camp. D. M. Hyde, an old Pinal county prospector, who has battled with fortune for eight years in this Territory, shipped ore this week from the Hattie—14 sacks through Zeckendorf and 6 sacks to Denver—which averages from $700 to $800 per ton. This is not one of the mines that incorporate for $10,000,000 and then can't raise money to get their stock certificates from the engraver. It is business, and we want a hundred more such men in this district.

COLORADO.

RUSSEL GULCH.—Idaho Springs *News*, Sept. 20: E. W. Williams and Wm. Joyce have commenced to sink a new shaft on the Badger lode, situated near the Nimrod. The top quartz prospects from 5 to 6 ounces to the cord. Sterns, Mellow & Co. on the Virginia lode, are breaking large quantities of mill ore and considerable smelting ore. The mine is looking better than ever. Mr. Andy Risar, working the Ada lode, shipped three tons of smelting ore to the Idaho Sampling works last week, which looked very fine. The mill dirt has a sprinkling of free gold in it. Scott, Rappin & Co. shipped a car-load of iron to Golden last week. The leasers of the Delaware lode have taken out the water and commenced breaking ground. Some of the ore from this mine run as high as $500 to the load.

IDAHO.

ANOTHER SMELTING ENTERPRISE.—Wood River *Times*, Sept. 23: Two gentlemen arrived by train, Sunday evening, to look into our sources of ore supply and probable future production, with the view of founding a huge smelting enterprise at or near Pocatello, at the junction of the Utah Northern and Oregon Short Line Railway. These gentlemen are mining engineers who have had many years experience in the reduction of ores, and they entertain the opinion that smelting will never pay in the Wood River region, because the ores are not sufficiently diversified. With works at Pocatello, however, this would be changed as from that point ores could be got from Montana, Idaho, Utah, and even Oregon and Colorado, and any character or grade of ore wanted could be obtained on short notice. In this way the quantity of flux used would be reduced to a minimum, and a good profitable smelting business could be conducted.

THE GALENA SMELTER.—Galena and vicinity really promises to awaken from the lethargy in which it has been plunged for three years. The smelting works have passed into the hands of a strong New York company, and Mr. McCullough is on the ground buying ores and laying in supplies, preparatory to blowing-in the furnace in the spring.

MONTANA.

AMONG THE MINES.—Butte *Miner*, Sept. 24: In going around among the mines Saturday a noticeable feature was the large amount of representation going on. To look at the number of patents issued for claims located in this district one would naturally conclude that there was nothing left for men to represent. It does not appear yet that more than a third of the claims have been patented. West of the Lexington and across Missoula gulch well up toward the top of the hill is the Golden Rule. It is now leased by a company of whom Capt. Reynolds leads the list. There is a shaft on this claim 100 ft deep. They have taken out very little ore as they have been sinking. No cross-cuts have been made and no levels been run. Saturday when the reporter was at the mine they were putting in a No. 4 Knowles pump. A small steam boist is doing the elevating for the mine. One assay was made that ran up to 173 ounces. The average assay, however, will not exceed 100 ounces.

MONO.—This is one of those prospects that are intended by providence to try a miner's faith and empty the pocket at the same time. From the surface it shows a 3 ft vein, with but little ore and that ore scattering. If there were enough of it, it would be called manganese. But there is one encouraging feature and that is the deeper the shaft goes the better it looks. The shaft is 25 ft deep now. This mine is northwest from the Moulton.

GOLDSMITH.—This lead is owned by Tong, Nichols & Roach. It has been worked by Tong, on a lease for several months. The lease has about expired and it is about to be leased again to the same party. It has been considerably prospected near the surface. There are in the lead 7 shafts varying from 35 to 100 ft deep. The principal work this summer has been done in the 56-ft shaft. It has been a profitable lease to all parties concerned. Some assays have been made that reached 150 ounces. The average has been between 50 to 60 ounces.

BELCHER.—Donahoe & Moore are working this mine on a lease. Last winter some parties had the mine bonded who worked it for a while, but did not attempt to put in proper timbers. In the spring when the frost left the ground the mine of course caved in at the shaft. The parties now working it have sunk a new vertical shaft. It has reached a depth of 32 ft.

ARGONAUT.—J. H. Glen & Co., the owners, are working this mine. There are two distinct leads in this claim. They have been sinking for some time a vertical one-compartment shaft between the leads. It has now reached 70 ft and this week the owners propose to start levels to cross-cut the leads.

GLENGARRY.—This mine, about a mile north of the Moulton, is a good piece of property. It belongs to McRae & Hughes. This claim takes in two veins. A vertical shaft 50 ft deep was sunk to work the south vein. The width of this vein varies. In some places it is 8 ft wide. The ore varies from 4 to 6 ft. At 50 ft on this vein a cross-cut was made and a level 200 ft long was run. From this level over a hundred tons of ore were taken, which returned to the owners, after paying all expenses, $60 to the ton.

RESCUE.—DeBow & Madison have about bought this mine. It has a vertical shaft 110 ft deep. A cross-cut has been made at 100 ft, showing a 5-ft vein. About 18 inches of this will assay 100 ounces. The remainder of the vein will average about 25 ounces. A contract has been let and work begun to sink the shaft 50 ft further.

ROCK ISLAND.—This mine is southeast of Walkerville, and is being worked on a lease by Voulton & Co. They are working night and day shifts. The shaft is down 130 ft. Hoisting is done by a whim. Level has been run 30 ft each way on the lead at 125 ft. The lead at that depth is 18 ft between walls. There are in the lead three veins of paying ore, each about three feet wide. In the six months this company has worked the mine, they have sold over 500 tons of high-grade ore.

RADERSBURG.—Cor. Butte *Miner*, Sept. 27: The Silver Bell is situated 7 miles west of Radersburg, in no organized mining district, but in the main range dividing Boulder and Crow Creek valleys. The ore of the Silver Bell is uniform and assays the same from either side or from any place it may be taken, very many assays have been made in Butte, Helena, Elk Horn and other places, and the very lowest shows 78 ounces in silver and 30 per cent in lead. Mr. Parker and Mr. John Nevill, after having traced the lead northwest, at once located the extension of the Silver Belt and called it the Ned lode. Messrs. Parker and Nevill began operations 10 days since on an intervening hog-back in the center of their new location. One week's work at a depth of about 14 or 16 ft has uncovered a body of ore, so far as discovered, between walls, about 7 ft in width. Three feet of this is almost solid galena, and September 11th assays give 212.90 ounces silver and 1.46 ounces gold, or a total value of $278.27 per ton. The vein is widening gradually, and steady work is going on. Very many locations have been made in this section of the country, and more are being made in every direction. Iron veins are numerous and copper is common, but of low-grade. The Silver Bell and Ned leads both carry a trace of copper and some manganese. The country is broken up, but is easy of access, with good roads running through it. The famous Elkhorn mine is but 15 miles west from the Silver Bell. With a smelter and concentrator the two mines above mentioned, properly handled, would outrival any mine in Butte or the vicinity. I have seen nearly every dump of importance in Montana, and without exaggeration can truthfully pronounce this vein one of the very richest on the Pacific or northern slope. Over 200 tons are on the dump at the Silver Bell and quite as much will be on the Ned dump in side of a week. Good roads have been graded to both mines, and a shaft house will be erected at once over the Ned, while a tunnel will be started in a few days on the lead to strike the main shaft of the Silver Bell, when it will be sunk to make connection at a depth of 250 ft. The Skinner lode is situated about two miles in a southeasterly direction from the Silver Bell lode. The vein has been opened in two different places 200 ft apart. The shaft is about 20 ft deep and an open cut on the lead produced good pay. The character of the rock is gold bearing but carries silver, galena and copper. The ore worked so far has been by arastra process and but $12.75 per ton has been saved. The Surprise lode owned by Zimmerman & Ritchart, original discovers, was found in October last. The lead has been traced for 700 yards and two shafts 25 ft each in depth, and 45 ft apart, have been sunk. Ore is being taken out from the main body. The placer diggings in the vicinity of Radersburg are about all shut down at present, as the season is over, or, in other words, water is too scarce. There are still very many pieces of valuable claims here which could be worked to profitable advantage did not the parties owning the water charge such exorbitant rates.

NEW MEXICO.

NOTES.—Silver City *Enterprise*, Sept. 13: Seven tons of concentrates from the Cooney mine arrived here for shipment on Monday last. Weekly shipments of ore and concentrates are regularly made from this important property. Work was resumed on the Black Hawk mine at Bullard's peak, on Monday. Lincoln Merrill was placed in charge as foreman and development will be pushed forward with as much vigor as heretofore. The management want from 15 to 20 first-class miners immediately. It is their intention to work about 30 men for the present. A number of men, it is understood, will go from Fleming to the Black Hawk. The Carrolton mill has been leased by Sam Green who started it up on Providencia ore last week. Other ores will be treated when the supply on hand is exhausted. Kingman, Smith, and E. H. Bonner made a 12-ton shipment of high-grade ore from the Burro and Argenta mines, at Fleming, on Wednesday. This ore was taken from the surface of the claims. The workings have not yet reached a depth of 16 ft. The ore veins have gradually widened on both claims and give promise of going down. Work is being pushed forward on both claims as rapidly as possible. The Mimbres mill is running on three-quarter time, so we are informed by the company's superintendent, Mr. Phebe, who visited this city on Monday last. Steady bullion shipments continue and the output from the mines is steadily increasing. John A. Miller returned from the Mogollons on Monday, and is making arrangements to return and start 30 men to work upon his Silver Bar mine, which is the first extension of the Cooney, and is a very valuable property. Several different points upon the claim will be worked where mineral can be extracted.

MILL.—Silver City *Enterprise*, Sept. 26: Wagner's mill, at Pinos Altos, is running 10 hours a day, and is said to be doing very satisfactory work. It is running mostly on custom work. The Old Man Co., at Fleming, is now sinking a large well in the gulch a short distance below Jackson's saloon. Should a sufficient supply of water be obtained no doubt the company will immediately commence the erection of a large mill to treat their ore. Messrs. Kingman and Smith, who have a lease on the Burro mine at Fleming have received returns from ore shipped to Billing works at Socorro, which averaged 92.55 ounces per ton. Capt. Cooney, of the Silver Hill M. Co., in the Mogollons, has purchased the engine and boiler formerly used in Kelley's saw-mill, and with this additional power he will double the capacity of his mill by adding five stamps and two Frue vanners. Development work is steadily progressing on the Cariboo mine, at Fleming. Three open cuts are being run across the vein on the surface, and a drift is being run along the vein at the bottom of the main shaft. A vein of quartz over 30 ft wide has been uncovered at the surface. The long dormant Cooney camp in the Mogollon mountains is taking on a boom. Since Capt. Cooney's magnificient success under the most discouraging circumstances, confidence has taken the place of doubts and uncertainties, and bustling activity the place of idleness. The company's mill at Pinos Altos, owing to a scarcity of water, is only running on half time, and frequently but five hours a day. The company contemplates sinking an artesian well soon, after which time, no doubt, an abundance of water will be had. It is probable that the mill will be shut down altogether in a short time, until the fall rain shall have set in. Development work on the mines, however, will be continued.

OREGON.

NOTES.—Jacksonville *Times*, Sept. 27: John W. Robinson has sold his interest in a mining claim on Evans creek to J. Tyler. Oliver Nadau of Sardine creek will put hydraulic pipe in his placer mines this season and proposes operating on a more extensive scale than ever. John Miller is getting his mines on Farmer's flat in readiness for the winter season, intending to operate on an extensive scale, if there is any water. Miners are getting ready for winter. They are not discouraged by their experience during the past few seasons and hope to have plenty water next time. Geo. H. Chick of Portland who has a quartz mill of his own invention, has rented Morse & Jacob's quartz mill near Henley, Cal., and will soon commence crushing ore. He claims to be able to work up sulphurets to perfection.

UTAH.

REVIEW. Salt Lake *Tribune*, Sept. 19: The week has been a pleasant one for weather, and the general activity has been fair. A notable local mining event is the attachment of the Frisco Con. property at Bingham by Parke, Lacey & Co. The movement of the metals has been rather above average, and the season is now at its best. The shipments of ore and bullion from this city for the week ending Sept. 13th, inclusive, were as follows: 47 cars bullion, 1,237,153 lbs.; 24 cars ore, 766,830 lbs.; 1 car white lead, 20,056 lbs. Total 72 cars, 2,024,039 lbs. The receipts of bullion and ore in this city for the week ending Sept. 17th, inclusive, were, $140,205.36 of bullion and $12,538 of ore; a total of $152,743.36. For the week previous the receipts were $136,823.36 in gross, of which $128,023.36 was bullion and $8,200 was ore. The shipments of the Horn Silver for the week were 23 cars of bullion, $69,000, bringing the shipments for the year up to the sum of $1,800,000, exactly half of which has gone in three equal quarterly dividends. The Ontario shipped for the week, 54 bars of bullion, assaying $36,029.61; carrying the total for the year up to $1,201,930.14, of which a little more than half, or $600,000, has been paid in eight monthly dividends of $75,000 each, or fifty cents per share. A syndicate of young men have leased the Durant 10-stamp mill at Bingham with privilege of buying, and are trying a new amalgamating table for the gold ores. As much of the gold as possible is of course caught in the batteries. Then the material passes on to a table six ft in diameter, set on a pivot and revolving three hundred times a minute. In the center of this table is a bowl-like depression in which 50 pounds of quicksilver is placed; the rotary motion spreads this out on all the inner surface of the bowl. Surrounding this are copper riffles, three or four inches high, between which similar riffles, set in the corner of the table, shut like teeth, leaving however, space for the material to gradually work its way outward between them. One battery has been supplied with this table and 10 tons or so run through. Assays indicate that it caught more than 70 per cent of the gold, but not enough was done to make a thorough test. The table was invented by Mr. Schuler, assayer formerly for the Old Telegraph, and for the Stewart, who has made a special study of the Bingham gold ores. Prof. Morton has obviated the difficulty at first met with in leaching his ores, on account of lime being in the ore. There remains the adjustment, so to speak, of the machinery to the ores, the draft, the fire, the feed, the proportion of salt. Little doubt is entertained of speedy success. So far as the leaching itself is concerned, Mr. Morton is well satisfied. The Crescent tramway is all laid save from the main street in Park City across to the concentrating mill. For the latter the machinery is all on the ground, and it is roofed over and is being put up. Mr. Colbath has received the first car-load of ore from the Summit, lying just north of the Cave in Bradshaw district. It is believed the Summit will soon be added to the great producing mines of Utah. Mr. Wagener has been working on the Moltke, south of Alta, off and on for twelve years, and has probably expended $25,000, mainly in adit tunnels at different levels, of which he has run more than 2,000 ft. The ore that has been found was high grade (60 lead and 145 silver) but it has not yet been found in large quantity. The lower tunnel has passed under the Discovery, where a shaft was sunk 75 ft and the workmen say it begins to look more promising. Mr. F. W. Billing has purchased and sent East 10,000 tons of Utah ores during the past year, mainly from the Eureka Hill, and the Beck & Bullion, adjoining. The ores are what are called "dry ores," carrying but little lead. They are worked in with lead ore in small quantity, and it is a relief to this market to have them sent away, because of the comparative lightness of the totality of ore lead-smelting plant. The owners get better prices for the ores. Mr. Billing thinks the ground all about Eureka Hill will be found to be full of ores. Locations have been made and the claims are being opened, and an increase of production is confidently expected in that vicinity.

THE DALY STRIKE.—Southern Utah *Times*, Sept. 13: Some weeks since a report was circulated throughout the camp that a rich strike had been made on the Daly property; in fact that a continuation of the Ontario vein had been struck. Mr. Daly now informs us that he cut the vein on a drift from the 600-ft level, and that the vein is three ft in width, but they have not yet reached the foot wall. The ore taken from the vein assays about 300 ounces on an average, and is free-milling. Mr. Daly is now busy at work putting in pumps so that he will be able soon to handle the water and he is also building ore houses so that as soon as the pumps are in working order they will begin taking out ore. The strike is, from its nature, one of the most encouraging that has ever been made in the Park, as it not only opens up a new mine, but adds to the value of one already struck—that is the Ontario—by showing that their vein runs with more or less regularity through their entire ground to the Daly property which joins them on the west. We may now hope that in the near future we will have another Ontario mine and mill in our midst, thus guaranteeing to Park City a long lease of life, and also that the dull times that have been with us for so long a time may in a great measure be done away with. This strike will also give courage to other companies that have been laying idle for a long time, not having faith or money enough to continue work.

NEW MILL.—Salt Lake *Tribune*, Sept. 16: Mr. J. W. Harker informed a reporter yesterday that he had succeeded in securing the water-power at the mouth of Cottonwood canyon; that he had purchased the mill at Camp Floyd, and proposed immediately to erect ten stamps and commence work, with the object of adding 40 more stamps in the spring. The design is, by power that costs nothing but the first plant, and by building so as to obviate any unnecessary handling of the ores, to work successfully the thousands of tons of low-grade ores in this region.

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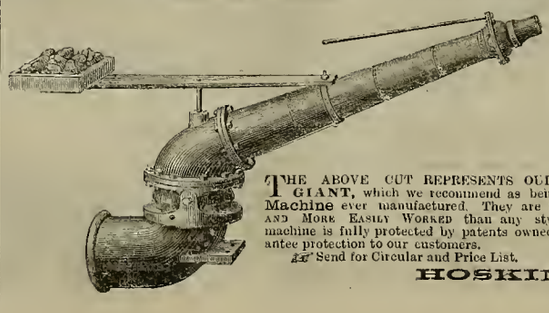

—TO—

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THE ABOVE CUT REPRESENTS OUR NEW IMPROVED GIANT, which we recommend as being the Best Hydraulic Machine ever manufactured. They are SIMPLER, LIGHTER, CHEAPER AND MORE EASILY WORKED than any style heretofore made. The machine is fully protected by patents owned by us, and we will guarantee protection to our customers.

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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price. Our New Illustrated Catalogue, with prices, will be sent on application.

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Ores Sampled and Assayed, and Tests made by any Process.
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RICHARD C. REMMEY, Agent,

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Manufacturer of all kinds of **Chemical Stoneware** —FOR— **Manufacturing Chemists.** Also Chemical Brick for Glover Tower.

BOUND VOLUME OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce, and valuable for future reference and library use.

MECHANICS' INSTITUTE INDUSTRIAL EXHIBITION.

(Of the City of San Francisco.)

PREMIUMS AWARDED.

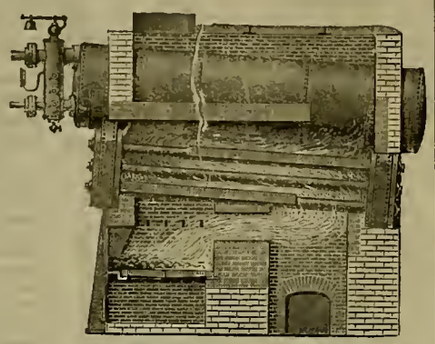
HEINE PATENT SAFETY BOILER,

RISDON IRON AND LOCOMOTIVE WORKS.

Sole Agents for the Pacific Coast, - Corner Beale and Howard Sts., San Francisco.

FIRST PREMIUM AWARDED at MECHANICS' FAIR, 1884.

Economy in space and fuel. Safety at high pressures. Freedom from scaling. Equally adapted for power and heating purposes. Especially adapted for mills, factories, hotels, stores or any place where safety is a necessity. Will work well with muddy water and any kind of fuel.



TESTIMONIALS.

ST. LOUIS, MO., Sept. 23, 1883

Messrs. Adolphus Meier & Co.—GENTLEMEN: We cheerfully certify that the "*Heine Patent Safety Boiler*" put up by you in our establishment has proved very satisfactory in its working. The chief points of excellence in the "Heine Safety Boiler" are its economy in fuel and space, freedom from scaling, aptitude for power and heating purposes, working equally well with clear and muddy water. We warmly recommend it to all using steam machinery. Yours truly,

ANHEUSER BUSCH BREWING ASS'N.

OFFICE OF SUPT OF ROYAL RAILWAYS, BERLIN, Sept. 23, 1883.

To Mr. H. Heine, Civil Engineer: In reply to your inquiry of September 24, we respectfully inform you that the three boilers built under your patents, under steam since September 25, 1881, at the Alexander Place Depot, as well as the two at Friedrich Strasse Depot, under steam since September 22, 1882, have given good satisfaction, requiring no repairs whatsoever to date. The internal cleaning of the boiler was always accomplished with ease on account of the convenient arrangement of the tube caps, the adhesion of scales being fully prevented thereby, and the boilers kept in prime condition.

(Signed): BRAUCKE.

Send for Circular and Prices.

PERFECT PULLEYS

First Premium Awarded at Mechanics' Fair, 1884.

CLOT & MEESE,

Sole Licensed Manufacturers of the

Medart Patent Wrought Rim Pulley

For the States of California, Oregon and Nevada, and the Territories of Idaho, Washington Montana, Wyoming, Utah and Arizona. Lightest, Strongest, Cheapest and Best Balanced Pulley in the World. Also Manufacturers of

PAT. OCT. 25, 1881.

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☞ SEND FOR CIRCULAR AND PRICE LIST. ☜

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Edward A. RIX & Co.,

18 and 20 Fremont Street, San Francisco,

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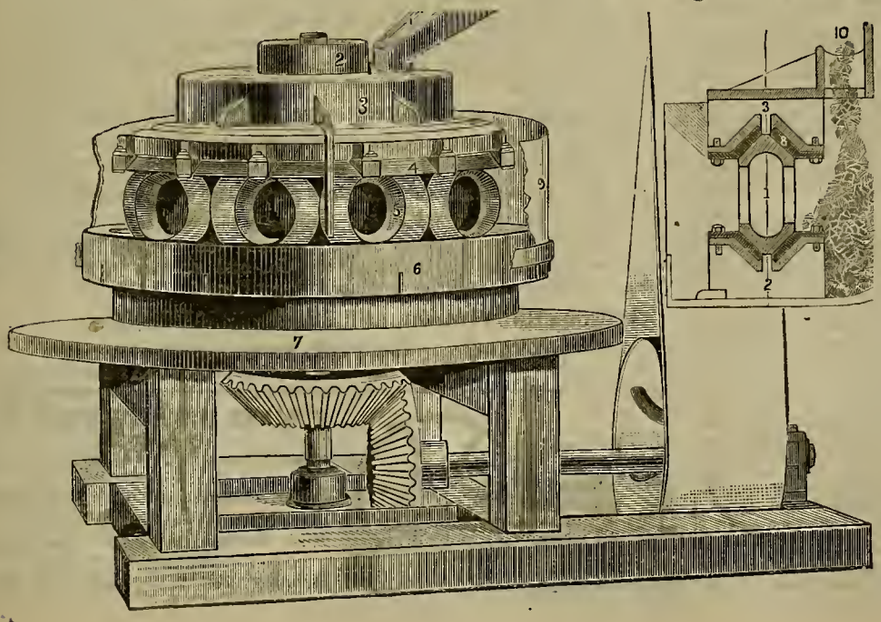
SILVER MEDAL FOR NATIONAL AIR COMPRESSOR.

BRONZE MEDAL FOR ORNAMENTAL IRON WORKS, FENCINGS AND CASTINGS.

HILL'S TRIUMPH ORE MILL.

THE KING OF Quartz Mills.



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Anti-Friction, Light Motive Power, Unequaled Results. A Low-Priced, Perfect and Economical Machine.

WORTHY OF INVESTIGATION.

SURE TO GIVE SATISFACTION.

F. A. HILL,

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Silver Plated

AMALGAMATING PLATES,

For Saving Gold.

First Premium Awarded at Mechanics' Fair, 1884.

Every description of plates for Quartz Mills and Wet or Dry Placer Amalgamator Machines made to order, corrugated or plain.

OVER 2,000 ORDERS FILLED.

The most extensive and successful manufacturer of these plates in the United States. Will fill orders for delivery in Rocky Mountain and Pacific Coast Mining States at lower prices than any other manufacturer.

Old Mining Plates Replated. Old Plates bought or gold separated for low percentage of result.

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SAN FRANCISCO PLATING WORKS,

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E. G. DENNISTON, Proprietor.

CHILLED CAR WHEELS.

Medal Awarded, Mechanics' Fair, 1882

STEIGER & KERR, Occidental Foundry,

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☞ IRON CASTINGS OF ALL DESCRIPTIONS.

CALIFORNIA ARTIFICIAL STONE PAVING COMPANY,

No. 404 Montgomery Street, San Francisco.

FIRST PREMIUM AWARDED AT MECHANICS' FAIR, (S. F.) 1884,

For ARTIFICIAL STONE PAVEMENT.

GOLD MEDAL AWARDED

—AT—

Mechanics' Fair, 1883 & 1884

—FOR—

Automatic Cut-Off Engine.

SILVER MEDAL AWARDED

—1883—

For Best Hoisting Engine and Boiler Combined.

W. H. OHMEN,

Machine and Engine Works

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PACIFIC POWER CO.

Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in building. Apply at the Company's office, 314 California street.

San Francisco Cordage Factory.

Established 1856.

Constantly on hand a full assortment of Manila Rope, Sisa Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.

Extra sizes and lengths made to order on short notice.

TUBBS & CO.

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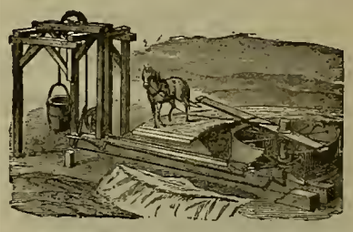
UNITED STATES MINERAL SURVEYOR for Utah and Idaho. Notary Public. Geological Examinations, Reports on Mining Properties, Surveys Mines, Railroads and Canals, and Superintends the workings of the same. Prepares Estimates and Plans for Opening and Working Mines, Expert on Mining Questions berfore the Courts. Address P. O. box 1157, Salt Lake City, Utah.

MINERS' HORSE WHIM.



ONE HORSE CAN EASILY HOIST OVER 1,000 LBS. at a depth of 500 feet. The Whim is mainly built of wrought iron. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending the bucket. The standard of the whim is bolted to bed-timbers, thus avoiding all framework. When required, these whims are made in sections to pack on mules.

120 In Actual Use.

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THE HARMON SEMINARY,

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A BOARDING AND DAY SCHOOL FOR YOUNG LADIES.

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LEADING JOURNAL OF THE WORLD.

Established in 1860, this Journal has been eminently successful as a popular and useful mining and mechanical journal. Relative to precious metals especially, it is the leading mining paper of the world.

It is largely patronized by the leading Miners, Mine Owners, Su, erintendents, Engineers, Metallurgists, Chemists, Manufacturers, Mechanics, Scientific, Professional and Industrial "Men of Progress" on the Pacific Coast, and many leading Mining Men throughout the mining fields of the world.

It is by far the best advertising medium in the Pacific States and Territories for Mining, Mechanical, Engineering, Building and Manufacturing Tools and Implements Goods, Supplies, etc.

Being thoroughly able and reliable in its editorial and business management, and long established in the most progressive industrial portion of the Union, at present, its power as an advertising medium is unsurpassed.

Subscription, $3 a year. Advertising rates, moderate. Send for samples and further information.

DEWEY & CO., Publishers,
252 Market Street, San Francisco

Mining Share Market.

Dullness prevails in the stock markets, with low prices. The hope of the brokers seems still to be on the Comstock where they are working away as usual in hope of finding another bonanza. For a long time, however, they have been unrewarded in their efforts, but are constantly buoyed up by a "miners hope." At the north end the next work in order is the cutting out of a station at the 3300 level, preparatory to starting a west cross-cut. This will be work of great interest to mining men everywhere, for at that point is the deepest excavation in America. At the Ophir they are pushing ahead rapidly with the drifts on the 500 and on the 1500 levels. The operations in this mine will soon become quite interesting. On the 1700 level of the California good headway is being made in the northwest drift. From this they will presently begin cross-cutting, and will probably find low-grade ore that will pay for working. At Gold Hill the Yellow Jacket, Crown Point, Belcher and Kentuck companies are extracting and shipping to mills on the Carson river about the usual quantity of low-grade ore.

Bullion Shipments.

Paradise Valley, Sept. 23, $4,134; Navajo, 24, $14,240; Silver King, 27, $19,631; Garfield, 27, $0,470; Grand Prize, 29, $6,500; Navajo, 29, $14,250; Standard, 24, $13,443; Contention, 24, $11,359; Hanauer, 23, $6,500; Nevada ore, 23, $1,680; Ontario, 23, $14,777; Horn Silver, 23, $12,000; Horn Silver, 24, $9,000; Crescent, 25, $6,500; Horn Silver, 25, $3,000; Ontario, 25, $4,790; Vienna, 25, $1,544; Day, 26, $4,250; Hanauer, 26, $5,500; Eureka ore, 26, $32,000; Horn Silver, 26, $6,000; Ontario, 26, $4,978; Stormont, 27, $3,450; Hanauer, 27, $1,750; Horn Silver, 27, $6,000; Ontario, 27, $6,552; Vienna, 27, $3,123; Christy, 27, $1,706; Hanauer, 28, $3,550; Crescent, 28, $4,100; Horn Silver, 28, $6,000; Ontario, 28, $5,905. The banks of Salt Lake City report the receipt for the week ending September 24th, inclusive, of $118,241.99 in bullion and $14,290 in ore; a total of $132,521.99.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superviser Court, Department 10, San Francisco:

DEL MONTE MILLING CO., Sept. 29. Objects, to manufacture flour and buy and sell grain. Capital stock $100,000, Trustees—Thomas J. Parsons of Oakland, Frederick Merkfessel of Sacramento, George D. Metcalf of Oakland, Victor H. Metcalf of Oakland, and John D. Gage of San Francisco.

UNDERGROUND CONDUIT AND ELECTRIC TELEGRAPH AND TELEPHONE CO., Sept. 29. Object, the manufacture and conducting of telegraph, telephone and electric light wires, and using the same either underground or overhead, or both, to manufacture electric machines, to purchase and control patents, etc. Directors, P. H. Blake, J. L. Armstrong, A. F. McGrew, John B. Anstin and M. Lebatard. Capital stock, $1,000,000.

SOUTH SAN FRANCISCO CABLE ROAD, Sept. 30. Capital Stock, $500,000. Directors—Thomas Harney, Thomas Brown, William Spreen, Timothy A. Nunan and John White. The company has obtained a franchise for a road and branches, from Third street on Harrison to Seventh, and along Seventh northerly to Market street; also from Harrison street, southerly on Seventh to and along Pennsylvania avenue, Tulare street, across Islais creek bridge, to and along R or Potomac street, Islais street, Twentieth street, Silver avenue to San Bruno road.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
J. J. BARTELL—Sacramento Co.
A. C. KNOX—Nevada (state).
B. W. CROWELL—Fresno and Tulare counties.
GEO. MCDOWELL—Plumas and Sierra counties.
WM. PASCOE—San Francisco.
WM. H. COOK—Los Angeles Co.
H. G. PARSONS—Idaho and Montana.
G. W. INGALLS—Arizona.
H. A. BEATON—Washington Ty.
L. L. WOODMANSEE—Oregon.
J. C. KOOP—Napa Co.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Arnold G & S M Co	Arizona	2	50	Aug	1	Oct	A Judson	320 Sansome st
Alta S M Co	Nevada	30	50	Aug	21	Sept	W H Watson	302 Montgomery st
Andes M Co	Nevada	25	25	Sept	23	Oct	J B Burris	309 Montgomery st
Butte Creek Hyd M Co	California	10	10	Sept	23	Nov	R L Taylor	230 Montgomery st
Cueva Santa M Co	Mexico	3	05	Sept	13	Oct	W L Oliver	328 Montgomery st
California M Co	Nevada	13	20	Aug	4	Sept	C P Gordon	309 Montgomery st
Champion M Co	California	16	10	Aug	22	Sept	T Wetzel	522 Montgomery st
Con Imperial S M Co	Nevada	21	10	Sept	1	Oct	C L McCoy	309 Montgomery st
Cabarca M Co	Mexico	9	03	July	18	Nov	C Bovie	328 Montgomery st
Day S M Co	Nevada	15	75	Sept	26	Nov	E M Hall	327 Pine st
Excelsior W & M Co	California	7	50	Sept	2	Oct	W J Stewart	215 Sansome st
Eintracht Gravel M Co	California	16	05	Aug	26	Sept	H Kunz	208 Sansome st
Equitable Tunnel M Co	Utah	30	40	July	29	Sept	A Wright	419 California st
El Dorado Con M Co	Nevada	3	04	Aug	16	Sept	J H Sayre	330 Pine st
Enterprise M Co	California	1	15	July	1	Sept	W Van Bokkelen	419 California st
Indian Spring Drift M Co	California	3	03	Sept	17	Oct	A B Paul	328 Montgomery st
Justice M Co	Nevada	41	15	Sept	11	Oct	R E Kelly	412 California st
Martin White M Co	Nevada	18	25	July	25	Sept	Wm Scoville	309 Montgomery st
North Gould & Curry M Co	Nevada	7	25	Sept	3	Oct	C H Mason	331 Montgomery st
Peerless M Co	Arizona	2	25	Sept	25	Nov	A Waterman	309 Montgomery st
Solid Silver M Co	Nevada	4	10	Sept	23	Oct	R Hewson	5 First st
Sterling M Co	California	1	05	Sept	18	Oct	W H Allen	306 Pine st
Savage M Co	Nevada	60	50	Sept	5	Oct	E B Holmes	309 Montgomery st
Sunumers Con M Co	California	1	05	Aug	18	Sept	F E Luty	330 Pine st
Tunitas Petroleum Co	California	2	1.00	Sept	29	Oct	W Bowie	601 California st
Utah S M Co	Nevada	50	50	Aug	18	Sept	G C Pratt	309 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Con Virginia M Co	Nevada	C W Havens	309 Montgomery st	Annual	Oct 15
Eureka Con M Co	Nevada	E H Willson	323 Montgomery st	Annual	Oct 20
General Lee M Co	Nevada	C E Gillett	454 California st	Annual	Oct 18
Ithaca Con M Co	California	W Granger	402 Montgomery st	Annual	Oct 11
Mayflower Gravel M Co	California	J Morizio	328 Montgomery st	Annual	Oct 6
Syndicate M Co	California	J Stadfeldt	419 California st	Annual	Oct 16

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	G W Sessions	309 Montgomery st	50	June 5
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Aug 26
Idaho M Co	California			4.00	Apr 2
Jackson M Co	California	D C Bates	309 Montgomery st	10	Mar 16
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 21
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Apr 28
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Mar 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Sept 5

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept. 11.		WEEK ENDING Sept. 18.		WEEK ENDING Sept. 25.		WEEK ENDING Oct. 2.	
Alpha	1.45	1.65	1.50	1.65	1.40	1.60	1.45	1.95
Alta	1.95	2.45	1.60	2.35	1.65	2.20	1.90	2.10
Andes	....	....	.20	.25	.20	.25	.10	.15
Argenta	....	.15	....	....	....	....	....	....
Belcher	.80	.90	.80	.90	....	.80	.90	1.00
Beldlug	....	....	....	....	....	....	....	....
Best & Belcher	2.30	2.50	2.20	2.40	2.15	2.30	1.85	2.20
Bullion	....	.45	....	.50	....	....	....	.40
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	.55	.60	....	.55	.55	.60	.50	.55
Bodie Con	1.95	2.15	2.00	2.05	1.95	2.10	2.00	2.40
Benton	.55	.70	.50	.70	.50	.60	.50	.60
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	....	....	.50	....	....	.55	.50	.55
California	.15	.55	.30	.35	.30	.35	....	.30
Challenge	....	....	....	....	....	....	....	.20
Champion	....	....	....	....	....	....	....	....
Chollar	2 15	2.70	2.20	2.45	2.10	2.50	2.10	2.35
Confidence	....	....	....	1.00	....	1.00	....	1.20
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	.25	.30	.20	.25	.20	.25	....	.20
Con. Pacific	....	.60	.60	.65	.60	.90	.50	.65
Crown Point	....	1.25	1.30	1.35	....	1.30	1.20	1.50
Day	....	....	....	....	....	.35	....	.05
Eureka Con	....	....	2.75	3.00	3.25	3.30	....	3.00
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	....	.40	.35	.40	.30	.80	.25	.35
Grand Prize	.40	.45	....	.40	.40	.45	.35	.40
Gould & Curry	1.95	2.25	1.95	2.15	1.80	1.95	1.40	1.80
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	2.75	3.35	2.85	3.25	2.85	3.25	2.35	3.05
Holmes	....	2.60	....	2.75	....	....	2.75	3.00
Independence	....	....	....	.25	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	.15	.25	....	.20	....	.15	.10	.15
Martin White	....	....	....	....	....	....	....	.50
Mono	1.70	.95	.90	1.40	1.05	1.40	1.30	2.00
Mexican	1.50	1.60	1.60	1.85	1.55	1.80	1.50	1.70
Mt. Diablo	....	....	....	....	....	....	2.40	3.00
Northern Belle	....	....	....	....	....	....	....	....
Navajo	3.60	3.90	3.55	3.90	3.60	3.75	3.00	3.60
North Belle Isle	....	....	....	....	....	.40	.35	.40
Occidental	1.10	1.15	1.30	1.60	1.30	1.40	....	1.25
Ophir	1.10	1.25	1.30	1.40	1.30	1.40	1.15	1.30
Overman	.15	.20	....	....	.15	.20	....	.15
Potosi	1.35	1.65	1.35	1.60	1.30	1.50	1.25	1.35
Final Con	....	....	....	....	....	....	....	....
Savage	1.20	1.40	1.20	1.45	1.25	1.40	1.00	1.20
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	1.35	1.50	1.45	1.60	1.40	1.65	1.35	1.50
Silver Hill	....	.10	....	.10	....	.05	....	....
Silver King	....	....	....	4.50	....	....	....	4.25
Scorpion	....	.25	....	.25	....	.20	.20	.25
Syndicate	....	....	....	.45	.40	.45	.45	.50
Tioga	....	....	....	....	....	....	....	....
Union Con	1.15	1.20	1.25	1.35	1.25	1.35	1.15	1.30
Utah	.80	.90	.70	.95	.75	1.30	1.10	1.30
Yellow Jacket	....	1.75	1.95	2.00	1.75	2.00	1.75	2.00
	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Oct. 2.

500	Alta		1.90
100	Andes		.15c
50	Alpha		1.50
100	Bulwer		.60c
250	Bodie		2.10@2.15
150	Crown Point		1.45
200	Chollar		2.15
100	Challenge		.25c
100	California		.35c
100	Exchequer		.35c
500	Hale & Nor		.27½@2.80
100	Justice		.10c
1650	Mono		1.50@1.60
100	Mexican		1.20
150	Ophir		1.15
150	Potosi		1.20
700	Savage		.95@1 00
100	Silver King		4 25
30	Union		1.15
70	Utah		1.05
80	Yellow Jacket		1.90

AFTERNOON SESSION.

700	Alta		1.90@1.95
170	B. & Belcher		1.90@1.95
400	Belle Isle		.50c
500	Benton Con		.60c
510	Bodie Con		2.05@2.10
450	Bulwer		.65c
600	California		.35c
100	Crown Point		1.60
200	Confidence		1.20@1.25
100	Eureka Con		2.90
220	Gould & Curry		1.40@1.45
250	Hale & Nor		2.90
200	Mexican		1.55
1930	Mono		1.35@1.50
140	Ophir		1.20
250	Overman		.15c
350	Potosi		1.25
200	Sierra Nevada		1.40
1940	Savage		1.00@1.05
30	Utah		1.20
50	Union		1.20
10	Yellow Jacket		2.00

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the canse it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

THE taxable property in Sonoma county foots up to $24,812,111. The county ranks seventh

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Oct. 2, 1884.

ANTIMONY—Per pound		@	
Hallet's	13	@	
Cookson's	14	@	
BORAX—Refined	9	@	9½
IRON—Glengarnock ton	25 00	@	
Eglinton, ton	24 00	@	
American Soft, ton	25 50	@	
Oregon Pig, ton		@	
Clipper Gap, Nos. 1 to 4	30 00	@	32 50
Clay-Lane White	22 50	@	
Shotts, No. 1	26 00	@	
Refined Bar	3	@	5½
Boiler, 1 to 4	5 00	@	5 50
Plate, 5 to 10	4½	@	4?
Nail Rod	7	@	
Norway, according to thickness	6	@	7
STEEL—English, lb	16	@	25
Black Diamond, ordinary sizes	14	@	
Drill	15	@	
Machinery	12	@	14
COPPER—Ingot	15	@	16
Buzzers' sizes	28	@	39
Fire-box sheets	28	@	
Bolt	23	@	25
Old	12½	@	15
Bar		@	
Cement, 100 fine	12	@	
Copper in New York, Sept. 25	13½	@	
LEAD—Pig	3	@	4
Bar	5½	@	
Pipe	7	@	
Sheet	8	@	
Shot, discount 10 on 500 bags: Drop, 2 bag	2 00	@	
Buck, 2 bag	2 20	@	
Chilled, do	2 40	@	
TIN PLATES—Charcoal	7 00	@	7 25
Coke	5 75	@	6 75
Pig	19 00	@	20 00
Banca tin	22	@	23
I. C. Charcoal Roofing, 14x20	6 25	@	6 50
ZINC—German	9	@	10
Sheet, 7x3 ft, 7 to 10 lb less the cask	9	@	10
QUICKSILVER—By the flask	30 00	@	
Flasks, new	1 05	@	
Flasks, old	85	@	

REMITTANCES to this office should be made by postal order or registered letter, when practicable. Cost of postal order, for $15 or less, 10 cts.; for registered letter, in addition to regular postage (at 3 cts. per half ounce), 10 cts

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & CO.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.]

FOR WEEK ENDING SEPTEMBER 23, 1884.

305,565.—REVOLVING CYLINDER ENGINE—J. J. Blair, Tacoma, W. T.

305,575.—WATER MOTOR—Jas. H. Culver, S. F.

305,446.—LOOM SHUTTLE—H. P. Garland, San Quentin, Cal.

305,523.—LIQUID COOLER AND WATER FILTER—D. H. Logan, S. F.

305,608.—LUBRICATOR—August Lotz, San Jose.

305,698.—VELOCIPEDE—R. B. Lunsford, Oakland, Cal.

305,610.—DEVICE FOR TURNING VEHICLES OUT OF CAR TRACKS—T. H. Macdonald, S. F.

305,612.—PEN BRUSH—Geo. Maderia, Santa Cruz.

305,790.—GRINDING PAN—Geo. H. Malter, S. F.

305,701.—STAMP BATTERY—Geo. H. Malter, S. F.

305,537.—FOLDING SKELETON GUN STOCK—Fred. Schwatka, Vancouver Barracks, W. T.

305,718.—CUT-OFF VALVE—J. P. Simmons, S. F.

305,556.—SAW HORSE—Richard Wylie, Napa.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

GRAIN SEPARATOR.—Alexander W. Lockhart, Stockton. No. 305,203. Dated Sept. 16, 1880. This apparatus is for separating thrashed grain from the straw, making the usual preliminary or ordinary cleaning of the grain, and also the recleaning, by which the grain is prepared for market in a single continuous operation. The patent covers a number of details of operation and construction.

SIDE-SPRING VEHICLE.—Z. M. Howell, Salida, Stanislaus Co. No. 305,193. Dated Sept. 16, 1884. The patent covers a new arrangement and connection of side bars or rails and body-supporting springs. The object of the invention is to provide a simple frame for the attachment of the spring, and such an arrangement and connection of the spring therewith, that, whether in a four or a two-wheeled vehicle, they may possess that independence of movement which will enable them to remain unaffected by the unpleasant movement of the vehicle frame derived from the jerking and jogging of the horse.

CUT-OFF VALVE.—Jno. P. Simmons, S. F., assignor of one-half to Wm. H. Ohmen. No. 305,718. Dated Sept. 23, 1884. This invention relates to certain improvements in engine valves, and it consists of a novel combination of a conically-shaped valve oscillating or partially rotating within a similarly-shaped valve chamber, and steam chest, and an interior concentrically placed cut-off valve, also rotating so as to limit the admission of steam.

LUBRICATING OILS

May we suggest as the result of a long experience in the manufacture and use of Oil, the following facts:

1. Generally, twice as much Lubricating Oil is used as is necessary.
2. The Oils generally used in the West, cost too much money.

There is no use of paying the high prices necessarily demanded for Lard, Tallow, Castor, China-nut, and other animal and vegetable Oils sold for Lubricating purposes.

WE GUARANTEE TO SAVE FROM 25 TO 50 PER CENT.

☞ Please write us briefly for what purpose the Oil is used, and we will return GRATIS enough oil to prove what we say. Our oil has now been adopted as

Cheaper, More Economical, and More Serviceable than any other Oil

On the Central and Southern Pacific Railroads, the Northern Pacific, South Pacific Coast, and North Pacific Coast Railroads, the Oregon Railway and Navigation Co., Pacific Coast Steamship Co., and all the prominent Iron Works, Saw-mills, etc., on the Coast and Puget Sound. ADDRESS:

THE CONTINENTAL OIL AND TRANSPORTATION CO.,
CHARLES J. WOODBURY, Manager Lubricating Department,
123 California Street, San Francisco, Cal.

STEARNS MANUFACTURING CO.,
PACIFIC BRANCH,
21 and 23 Main St., - - San Francisco
.....BUILDERS OF.....
Heavy Automatic and Slide-valve Engines,
STATIONARY and PORTABLE BOILERS,
And Heavy Saw-mill Machinery,
....SOLE AGENTS FOR THE....
Skinner & Wood Portable Engines and Boilers

Business at Butte City, Montana.

Our correspondent at Butte sends us the following notes concerning the business houses at Butte, Montana.

The spirit in business at Butte is that of wide-awake, enterprising men, keen to avail themselves of the best the market offords, and not inclined to follow in grooves and ruts. Their predictions have been to buy at wholesale in San Francisco, or on the Pacific coast; but the shrewd dealers and manufacturers of the East are supplanting by slow degrees the Pacific coast traders. We of California must be alert and sharp to hold a portion of the immense prospective trade of Montana. The railroads here favor freight from the East, which is large odds to contend against; but in the matter of heavy machinery this difference is said to be small compared to the advantage in first cost at Eastern foundries. The machinery for the three large concentrating and smelting works now in process of erection came almost entirely from the East.

The buildings now being erected in Butte, and the improvements of mine owners, show that there is a feeling of confidence in the permanence of the mining industry. This feeling cannot but be shared by the observant visitor, as he sees evidence of great ore bodies in mines already developed and prospects of equally great things in the undeveloped mines that are so thickly scattered through the town.

Some of the most successfully operated machinery of this district and of Montana is that placed by E. D. Reynolds, Esq., who is one of the well informed gentlemen of Butte to whom our agent is indebted for much information and many courtesies. He represents the Fort Scott Machine Works, which have placed large plants in many parts of the Territory; also Griffith & Wedge, Zanesville, Ohio, and other manufacturers of mining and milling machinery.

Some of the Leading Business Houses of Butte City.

There is, perhaps, no more conspicuous success in the mercantile field to be met with anywhere throughout this great region of Territories than that of Sands & Boyce, of Butte City. The firm is composed of Mr. A. Sands, Denver, Col., Mr. J. Sands, the resident New York buyer, and Mr. J. R. Boyce, Jr., who is the resident and managing partner, and to whose energy and zeal the unparalleled success of the firm is largely due. Dry goods, ladies' seal and other wraps, dresses, notions, carpets, wall paper, ready-made clothing, gents' furnishing goods, etc., are the principal lines of goods in which the firm deals, and its business, which is both wholesale and retail, extends throughout Montana and the adjoining Territories. Their place of business occupies one of the most eligible sites in the city of Butte, and their extensive salesrooms are said to contain more square feet than those of any similar business in the Northwest. They are lighted by electricity, and are modern in every particular.

Gans & Klein, wholesale and retail dealers in clothing, gents' furnishing goods, boots, shoes, hats, caps, trunks, valises, etc., are the most extensive dealers in these lines that there are in Montana. The parent house is at Helena, and branches are maintained both at Butte City and at Benton, both of which branches carry as extensive stocks as do any houses in the city where they are located.

Among the solid business houses of Butte, that of E. L. Bonner & Co. stands pre-eminent. They have the finest store in the Territory, and lead all competitors in the magnitude of their business. They carry the largest and finest stock of dry goods, carpets, wall paper, ladies' suits and wraps, clothing, hats, boots and shoes, blankets and rubber goods to be found in the city. By treating all persons alike, by adhering strictly to one price, and making that price the lowest, they have gained the confidence of the public and built up the largest business in their line in the Territory. They not only do the largest retail business, but have also a heavy jobbing trade, shipping goods to nearly all parts of the Territory and into Idaho.

Besides these firms there are the following:

DONNELL, CLARK & LARABIE, bankers.

JOHN CAPLICE & CO., wholesale and retail dealers in groceries, boots, shoes, furnishing goods, etc., Main street.

E. W. WYNNE & CO., dealers in drugs, medicines, paints, oils, stationary and fancy goods, Main street.

LEVSON & TURCK, jewelers, carrying one of the most extensive stocks in the Territory, Main street.

J. KAHNWEILER, dealer in ladies' and childrens' furnishing goods, Main street.

A. COHEN, wholesale and retail dealer in groceries, provisions and produce, Main street.

ALTIEZ & BOHLER, manufacturing jewelers, and dealers in watches, clocks, and jewelry, Main street.

S. LOUIS, dealer in general household goods, guns, pistols, cigars, etc., Main street.

GEO. F. MARSH, general insurance broker, Main street.

OWSLEY & COWAN, proprietors of livery stables, Butte transfer line, Main street.

L. R. MAILLET & CO., wholesale and retail grocers, dealers in wines, liquors, tobacco and cigars, Main street.

WHITING & ALEXANDER, dealers in vegetables, family groceries, etc., West Park street.

C. NISSLER, proprietor Silver Bow brewery.

JOHN O'ROURKE, wholesale and retail dealer in wines, liquors and cigars, Main street.

HIGHT & FAIRFIELD, jewelers, 317 Main street.

R. PETTIT, dealer in furniture and upholstery, also undertaker, Broadway and Main streets.

C. E. FOWLER, gunmaker, and dealer in guns and ammunition, 40 West Park street.

A. SPECKART, wholesale liquor dealer and manufacturer of soda water, ginger ale, etc., Main street.

E. L. MAHONEY, manufacturer of boilers, sheet iron work, etc., East Park street. Repairing done.

CENTENNIAL HOTEL, corner Granite and Main streets, most centrally located hotel in town, Dr. G. W. Beal, proprietor.

METROPOLITAN RESTAURANT, 14 West Park street, Lachman & Demstan, proprietors. Oysters a specialty.

J. D. THOMAS, wholesale and retail dealer in groceries, produce, etc., West Park street.

J. C. SINGER, furniture and upholstery, West Park street.

BARRET & JACKY, dealers in harness and saddlery, West Park street.

Dewey & Co.'s Scientific Press Patent Agency.

OUR U. S. AND FOREIGN PATENT AGENCY presents many and important advantages as a Home Agency over all others, by reason of long establishment, great experience, thorough system, intimate acquaintance with the subjects of inventions in our own community, and our most extensive law and reference library, containing official American and foreign reports, files of scientific and mechanical publications, etc. All worthy inventions patented through our Agency will have the benefit of an illustration or a description in the MINING AND SCIENTIFIC PRESS. We transact every branch of Patent business, and obtain Patents in all countries which grant protection to inventors. The large majority of U. S. and Foreign Patents issued to inventors on the Pacific Coast have been obtained through our Agency. We can give the best and most *reliable* advice as to the patentability of new inventions. Our prices are as low as any first-class agencies in the Eastern States, while our advantages for Pacific Coast inventors are far superior. Advice and Circulars free.

DEWEY & CO., Patent Agents.
No. 252 Market St. Elevator, 12 Front St., S. F. Telephone No. 658.

A. T. DEWEY. W. B. EWER. GEO. H. STRONG.

WONDERFUL DEVELOPMENTS IN OPTICAL SCIENCE.—All complicated cases of defective vision most carefully tested after the most progressive method known to opthalmology, and, if any morbid changes are indicated, I will be only too happy to recommend the best opthalmic surgeon on the coast in time; especially in young children, where progressive myopia is manifested, and thereby induce parents to seek the advice of an oculist. It is a well known fact that the majority of near-sighted persons, especially if suited by a patent process, rest in fancied security, when their cases really need the attention of a pathologist. Near-sighted eyes are looked upon as unsound, with but few exceptions. All errors of refraction corrected with suitable glasses, applicable to myopia, hypermotropia, simple, compound and mixed cases of astigmatism. My lenses are made by the most skillful workmen of Paris, to order. Being constantly occupied in testing defective eyes, I have no disposition to lose valuable time in doing automatic labor at grinding lenses.

C. MULLER, Optician,
5 135 Moutgomery St., near Bush, S. F.

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First street, a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below costs, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. References as to above can be had upon applying to this office.

Mining Books.

Orders for Mining and Scientific Books in general will be supplied through this offices at pub'shed rates.

Chicago Prices Beaten!
ESTABLISHED 1860.
S. F. PIONEER SCREEN WORKS,
32 Fremont St., San Francisco.
J. W. QUICK, Prop'r.

Sheet Metals of all kinds perforated for Flour and Rice Mills, Grain and Malt Driers, Furnaces, Chess, Cement and Smut Mills, Separators, Revolving and Shot Screens, Stamp Batteries, and all kinds of Mining and Milling Machinery. Inventor and manufacturer of the Celebrated Slot Cut and Slot Punched Screens. Mining Screens a Specialty, from No. 1 to 15 (line).

☞Orders Promptly Executed.

JENKINS PATENT VALVES.
Gate, Globe, Angle, Check and Safety.

Manufactured of BEST STEAM METAL. We claim the following advantages over other Valves and Gauge Cocks now in use:

1. A perfectly tight Valve under any and all pressures of steam, oils or gases.
2. Sand or grit of any kind will not injure the seat.
3. You do not have to take them off to repair them.
4. They can be repaired by any mechanic in a few minutes.
5. The elasticity of the Disc allows it to adapt itself to an imperfect surface.

In Valves having ground or metal seats, should sand or grit get upon the seat it is impossible to make them tight except by regrinding, which is expensive if done by hand, and if done by machine soon wears out the valve, and in most cases they have to be dis connected from the pipes, often costing more than a new valve. The JENKINS Disc used in these Valves is manufactured under our 1880 Patent, and will stand 200 lbs. steam. Sample orders solicited. To avoid imposition, see that Valves are stamped "Jenkins Bros." For sale by

DUNHAM, CARRIGAN & CO., San Francisco, Cal.

THE GLOBE IRON WORKS CO.
Manufacturers and Repairers of all kinds of
MACHINERY AND CASTINGS
MINING, HOISTING, SAW MILL AND HYDRAULIC PLANTS
LOGGING, PORTABLE, STATIONARY, MARINE AND LOCOMOTIVE ENGINES,
AC'TS DYER CANNON BALL QUARTZ MILL
222 & 224 FREMONT STREET, SAN FRANCISCO.

THE "DUC" STEEL BUCKET!
Always First Premium in Competitive Trials.
Extra Strong and Very Durable.
Made of Best Charcoal Iron. Only One Seam. No Corners to Catch. Runs with Least Power.
☞BEST MINING BUCKET MADE.☜
H. P. GREGORY & CO., Agents, San Francisco.
PRICES GREATLY REDUCED.
IRON CLAD MANUFACTURING CO.,
22 Cliff Street, New York.

SQUARE FLAX PACKING.
Entirely Exempt from Hemp or Jute. Softest and Most Pliable Packing Made. Does not lose its Strength when worn by the rod, and does not Scatter or dissolve by power of Steam or Water.
Sufficient for a Trial will be Furnished, Free of Charge.
—MANUFACTURED BY—
W. T. Y. SCHENCK,
36 California Street, San Francisco, Cal.

A Great Triumph!
WON BY THE MANUFACTURERS OF THE
EUREKA CEMENT,
GOULD & HILL, Proprietors,
103 and 105 Fremont St., San Francisco.

On the 25th day of August, 1884, Judge Sahin, of the United States Court of Equity, decided the great infringement case of the Salamanda Felting Company of New York and Philadelphia vs. the EUREKA CEMENT, in favor of the EUREKA CEMENT. This decision is one of the most important that has been rendered for many years, because it gives Messrs. GOULD & HILL the unrestrained right to continue the manufacture of the BEST COVERING FOR STEAM BOILERS AND PIPES that is known to the world.

California Inventors
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By a sober, intelligent American, employment as Machinist, Agent, Writer, Engineer or Explorer, in any place or climate, where risk is considered in determination of wages. Address
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574 Folsom Street, N. E. Cor. Second, S. F.
ENTIRELY RENOVATED & NEWLY FURNISHED.

Sunny Suites and Single Rooms with or without Board at reasonable rates. Hot and Cold Water. Folsom street cars pass the door. Location and Appointments unexcelled in San Francisco.

The California Perforating Screen Co.
Al kinds of Quartz Screens, slot or round holes; zinc, copper and brass for flour and other mills. BOOK & WAGNER, 123 and 125 Beale St., S. F.

THE HOTCHKISS
Mechanical Boiler Cleaner
IS GUARANTEED TO
KEEP BOILERS ENTIRELY FREE FROM SCALE or MUD.
We Use No Compounds.
TRY IT!
We ask no payment unless it is perfectly satisfactory.
☞SEND FOR CIRCULAR.
CAVANAUGH & FREDRICKS,
Agents for Pacific Coast,
317 Mission Street, - - San Francisco

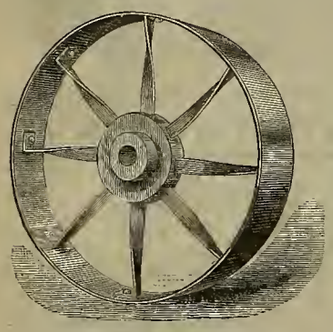
STOCKHOLDERS' MEETING.

Notice is hereby given that a meeting of the Stockholders of Fremont Mining and Milling Company will be held at the Company's office, No. 402 Front Street, Room 8, San Francisco, California, on Tuesday, October 7, 1884, at 12 o'clock M., for the purpose of electing officers for the Company, and of acting upon a proposed amendment of the By-Laws of the Company, providing that vacancies in the offices of President, Vice-President, and Trustees shall be filled by the Board of Trustees.

MARK T. ASHBY, Secretary.

Iron and Machine Works.

MACBETH'S
—PATENT—
STEEL PULLEY.



Advantages of these Pulleys.

They are less than half the weight of cast-iron pulleys; are polished on the face; are made either crowned or straight, and are turned in the lathe the same as the best make of cast-iron pulleys.

They are carefully balanced. They are subject to no contraction strains, and can be run at very high speed without danger of bursting.

On account of their great lightness and the form of the arms, they absorb less power than any other pulley.

They are *the only pulley of the kind* which runs true. They cannot be broken in transport.

TESTIMONIAL:

MATHER LANE SPINNING CO. (Limited), LEIGH, ENGLAND, Nov. 5, 1883.

N. Macbeth, Esq.—Dear Sir: The Patent Steel Pulleys supplied throughout to our No. 2 Mill are working to our entire satisfaction.

They are very true, and are about 50 per cent lighter than the cast-iron pulleys in our No. 1 mill.

Yours faithfully,
For the Mather Lane Spinning Co. (Limited),
(Signed:) RICHARD T. MARSH,
Managing Director.

Risdon Iron & Locomotive Works,

Sole Manufacturers and Agents for the Pacific Coast,

S. E. Cor. Beale & Howard Sts., San Francisco

☞ Send for Circular and Prices.

THOMAS THOMPSON. THORNTON THOMPSON

THOMPSON BROTHERS,
EUREKA FOUNDRY,

29 and 131 Beale St., between Mission and Howard, S. F

MANUFACTURERS OF CASTINGS OF EVERY DESCRIPTION.

California Machine Works,
WM. H. BIRCH,
Engineer and Machinist,

119 Beale Street, San Francisco.

— BUILDER OF —

Steam Engines, Flour Mill, Mining, Saw Mill and Dredging Machines

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UNION IRON WORKS,
SACRAMENTO, CAL.
ROOT, NEILSON & CO.,
MANUFACTURERS OF
STEAM ENGINES, BOILERS AND ALL
Kinds of Machinery for Mining Purposes.

uring Mills, Saw Mills and Quartz Mills Machinery constructed, fitted up and repaired.

Front Street, Between N and O Streets,
SACRAMENTO, CAL.

Golden State & Miners Iron Works.

Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.

STEVENSON'S PATENT
Mold-Board AMALGAMATORS,
Golden State Pressure Blowers.

First St., between Howard & Folsom, S. F.

California Brass Foundry,

No. 125 First Street, Opposite Minna.
SAN FRANCISCO, CAL.

All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rubber Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished on dispatch. ☞ PRICES MODERATE. ☜

H. WEED, V. KINGWELL.

COKE. PATENT. COKE.

This COKE is exclusively used by Prof. Thomas Price, in his assay office, by the Selby Smelting and Lead Co., Prescott, Scott & Co., Risdon Iron and Locomotive Works and others in this city. Large supplies are regularly forwarded to consumers in Salt Lake and Nevada, to the Copper Queen Mining Co., Longfellow Copper Mining Co. and other consumers in Arizona.

The undersigned are in receipt of regular supplies from Cardiff, Wales, and offer the COKE for sale in quantities to suit purchasers.

BALFOUR, GUTHRIE & CO.,
316 California St., San Francisco.

THE DUNCAN CONCENTRATOR

BEYOND QUESTION THE
Cheapest and Most Effective Machine
OF THE KIND NOW IN USE.
Adapted to All Grades and Classes of Ores

This machine has been thoroughly tested for the past two years under a great variety of conditions giving most extraordinary results, far in advance of anything ever before realized.

A recent competitive test made with the Frue at the Carlisle mine, in New Mexico, showed an advantage of 30 per cent in favor of the Duncan. The amount saved over the Frue being sufficient to pay the entire cost of the machines nearly every month of the year. The following is an enumeration of its many advantages over all other similar machines:

1. Its cost is not more than half that of any other of equal capacity, and the weight is nearly 1,000 pounds less, thus greatly reducing the cost of transportation.
2. The expense of setting up in running order is not more than one-third that of the Frue, or any other belt machine, much less grading and timber work being necessary.
3. The expenditure for repair is not more than one-fifth that of any belt machine, and they will last fully three times as long, working under the same conditions.
4. Not more than one-half the space is required—a point of great importance where a considerable number are used.
5. No special skill and very little care is necessary to operate it.
6. No more water is required than is furnished by the batteries.
7. It saves all the amalgam, gold or silver, that escapes the batteries, pans or settlers—AN INVALUABLE FEATURE, and claimed by no other, making the machine worth more than it costs for this purpose alone.
8. A much coaser grade of ore can be handled successfully than by any other machine—a great advantage in many instances where fine crushing is not necessary to eliminate the mineral.
9. It has no small and delicate mechanism, requiring nice adjustment and the closest attention—an insuperable objection to all belt and other forms of machines, making them wholly unfit for the rough service of a quartz mill.
10. Great simplicity of construction and small number of wearing parts. The whole machine is comprised in 17 pieces, only 3 of which are subject to any especial wear, and these can be replaced at a nominal cost. The Frue has 113 pieces, and some similar machines many more, making a complication of parts that involves constant repair and great expense in this way, as well as in loss of time.

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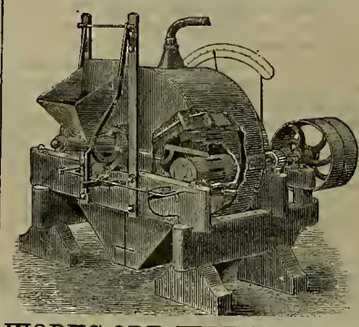

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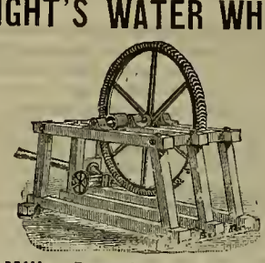

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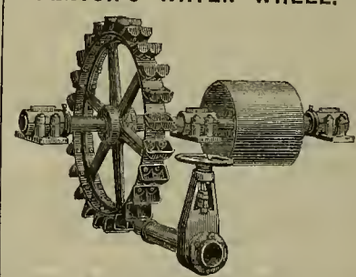

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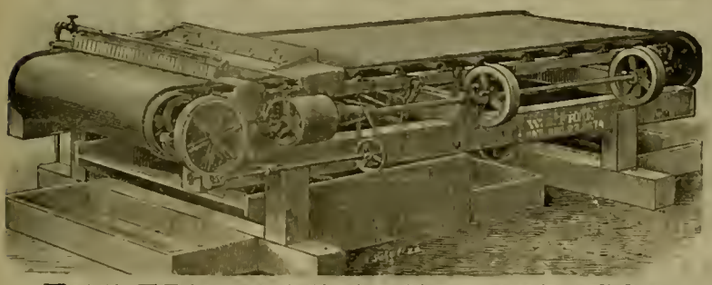

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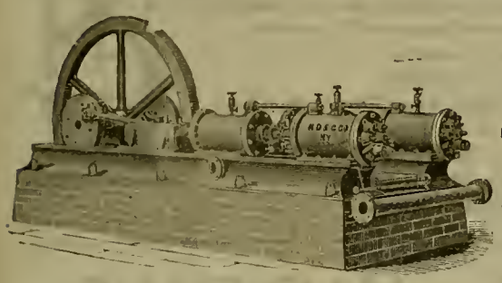

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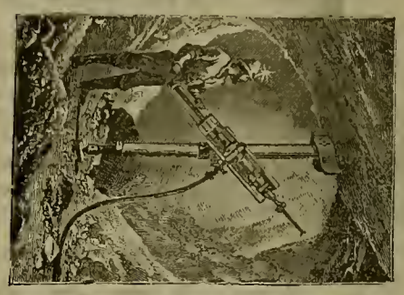

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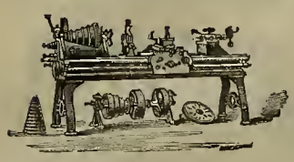

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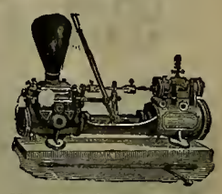

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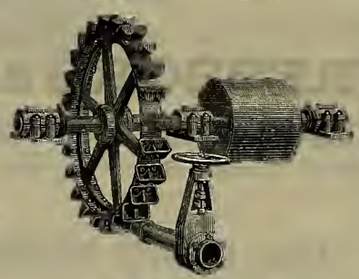

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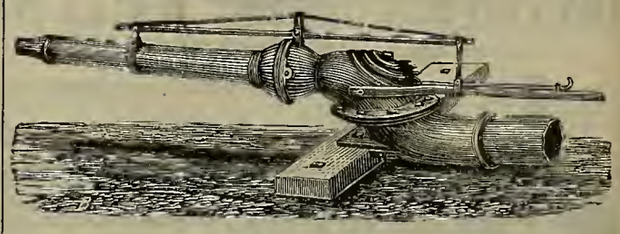

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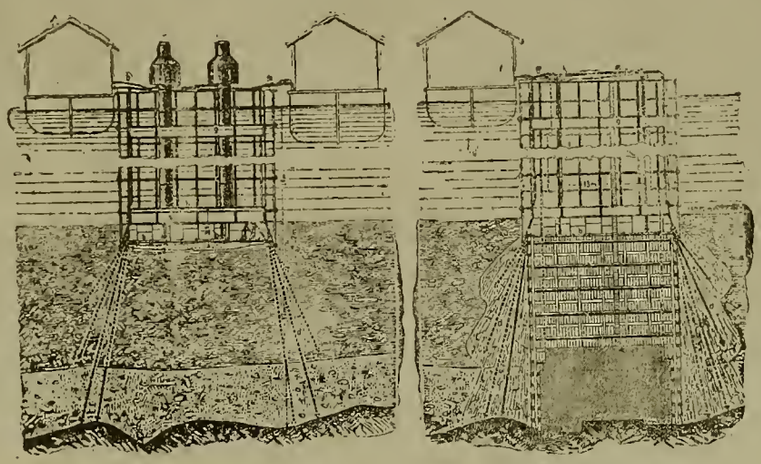
SAN FRANCISCO, SATURDAY, OCTOBER 11, 1884.

VOLUME XLIX. Number 15.

New System of Obtaining Pier Foundation.

In the MINING AND SCIENTIFIC PRESS of Aug. 23d, we gave a description of the Poetsch system of shaft sinking by freezing. This system has successfully been applied in mining operations, and the inventor has now a contract to apply it in sinking a series of bridge piers near Bucharest, Austria.

This last contract will be watched with especial interest, as the inventor claims, and seemingly with justice, that this freezing plan opens up possibilities, in founding bridge piers before undermined of. As opposed to the compressed air process, the main advantages are in the practical want of limitation in depth, and the relief of the laborers from the effect of the severe atmospheric pressure. We are indebted to the *Techniker* for the accompanying cuts illustrating the application of this process to the founding of bridge piers. Two cases are given; the first combines the Poetsch method with the pneumatic process, but in this case after the working chamber has been sunk to and into the river-bed, the congealing tubes are applied and the entire mass between the caisson and the rock frozen solid. As the caisson will then be practically sealed against the entrance of water, the air-lock can be removed and the masonry built up as in the open air. In the second case, compressed air is entirely dispensed with; an open caisson being sunk over the site of the pier and the freezing tubes put down through the water; when the congelation is completed the caisson can be pumped out and the work done in the open air.



APPLICATION OF THE PŒTSCH SYSTEM TO PIER FOUNDATION.

Neither of the above methods have yet been practically tested, but as before mentioned the attempt is about to be made at Bucharest. Its application to any special case would be controlled by the local circumstances; such as depth of water, thickness and character of the mud or sand deposit, and the currents and temperature of the water. In laying the masonry, precautions would also have to be taken to counteract the effect of the extreme cold upon the stone and the cement; Mr. Poetsch believes that the interposition of straw, cotton, refuse or other nonconducting material between the masonry and the ice-wall would accomplish this; and for a cementing material, a composition of tar, pitch or asphaltum and sand could be used, as these are not affected by frost.

The sinking of the pipes is done by aid of the water-jet. In the case of the *Centrum* mine, the large pipes were sunk with open ends, and afterward closed by a leaden plug and alternating layers of cement and asphaltum, with iron washers between, to prevent the escape of the congealing liquid. This method was found to be expensive and wasteful of time, and in the later work three pipes are used, the outer one merely to secure an opening into which can be sunk the two circulating pipes; in this case the bottom of the large pipe is closed by welding it together before putting in position. The entire plant can be used on any number of different works, as the pipes can be recovered as soon as the ground surrounding the shaft thaws out. The cost of sinking by this method is in proportion to the depth, and the time consumed in freezing is in similar ratio. The plant costs, in Germany, about $30,000.

Notwithstanding the unfavorable conditions, the first application of the Poetsch method was perfectly successful, as attested, not only by the Director, of the Archibald Mine, but also by many engineers who visited the works.

In new works undertaken by the inventor, he commences by filling the shaft to the water level with gravel, in case previous sinking has brought the work below that level. The method of putting in place the freezing pipes varies with the location. When the fluid soil has a slight thickness only, and the shaft is already sunk to the water level, the pipes are simply forced into the sand by a sand pump working inside. This was the system actually employed at the Archibald Mine and at the Max Mine, near Michalkowitz (Upper Silesia.) When the force of the liquid soil is considerable, a boring machine is used which puts down four pipes at a time, and is worked by the Schonebeck water-jet system. If the fluid soil is not at a great depth below the surface, the pipes are arranged in such a manner that a shaft of the desired dimensions can be sunk inside of them. But when this water stratum is at a great depth, and the sinking of the holes would be too costly, the shaft must first be sunk to water level with a diameter about one *metre* greater than the finished diameter; this larger shaft is timbered and the freezing pipes sunk inside.

If the water-bearing stratum incloses boulders, etc., of considerable dimensions, the holes are either inclined to avoid them, or they are removed altogether, or they are pierced through by special apparatus. As this method can be applied horizontally as well as vertically, the *Engineering News* suggests that an excellent point upon which to test its value in this country, would be the Hudson River Tunnel. In this case the silt and sand is very uniform in composition, and it should be no difficult matter to congeal the material in length of 100 or 150 feet at one operation.

THE EQUITABLE GAS MACHINE.

The Equitable Gas Machine.

An illustration is given on this page of the "Equitable" gas machine, intended for the artificial illumination of private houses, churches, public halls, machine shops, etc. The apparatus is quite simple, and is intended for the production of hydro-carbon vapor gas, by forcing ordinary atmosphere through a small body of gasoline, and directing the same through pipes to the various burners, in precisely the same manner as if coal gas were used. The reservoirs of the gasoline and the machine are separated, as shown in the cut, and the fluid is supplied automatically to the evaporating material as fast as it is used. By this method the body of gasoline is not exposed to the evaporating process, so that the last gallon is of the same gravity as when first poured in, and the lights are of the same brilliancy, because the generator being automatically supplied with fresh gasoline, there is no gas accumulating in the machine if no vent is made for the gas to pass out. The machine is completely at a stand-still if all the burners are closed.

This machine has a dry blower, which requires no water or other liquid, so there is no danger of any freezing. The air forced through is dry and pure, so it cannot produce condensations or a dim light. The air pump or blower is in the cellar, or anywhere about the house and the reservoir is at a distance from it. As seen by the engraving, the blower, with its motive weights, is in the cellar, and a pipe connects it with the carbureter. The gasoline tank, A, is filled from a barrel by the pipe, E, and the barrel removed and pipe closed. The carbureter is represented by B, and from it the gas-pipe runs, a cock, M, serving to turn on or off the gas. J is a glass tube, to ascertain the amount of gasoline in the carbureter, A. A cock, K, is used for draining off the gasoline in case the machine is removed. G and F are vent and gauge-cocks for the gasoline tank.

The blower is operated by the weights acting on a cord and spool, a crank being used to wind this up.

H. P. Gregory & Co., No. 2 California street, in this city, are Pacific coast agents for this apparatus, which has been extensively introduced in the Eastern States.

Gasoline is not forced into the pipes, and the light produced thereby, as many suppose. The gas generator in the carbureter carburets the air, forming carbureted hydrogen gas, which is the substance burned.

JAPAN is rapidly multiplying her industries. She is the New England of India in industrial enterprise. She will soon start a new plant of iron works at Kobe, by a native capitalist, who has engaged several hundred men trained at the Alabama Iron Works and elsewhere in Tokio.

WATER MILLS ON THE COMSTOCK.—It is said that the Virginia and Gold Hill Water Company are making arrangements by means of which water mills will be put up in operation on the Comstock for the reduction of low-grade ores. The *Enterprise* says "with a quantity of water to run one mill turned loose here on the lode, other mills might be put at short distances, all the way down Six-mile canyon. There would be little loss of water between mills, and the last of the series would be about as well supplied as the first."

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Helena, Montana.

Montana's capital is destined to be a city of great importance as the Territory of which she is the present metropolis develops and becomes enriched by the labors of miners, farmers, stock men and manufacturers. The Territory seems to have entered upon an era of permanent and sure progress. The chance and transitory discoveries of placer diggings in the early '60s has been followed by the opening up of quartz levels of great richness, and of almost limitless number. The mountains that rib the western portion of the Territory seem to abound in ledges of metal-bearing quartz. These ledges are fast being penetrated by the pick of the prospector, and it would require a volume to record the discoveries that are being made each year in the direction of valuable mining property. Capital does not need to hesitate for a chance for remunerative investment. If it does hesitate it is only to select the relatively richest claims out of the hundreds which would be classed as excellent in any other region. So in the future, as present claims become exhausted of their most valuable ores, other mines of equal merit will succeed them, and we shall see a constant progression in this great field of industry. Agriculture and stock raising will advance hand in hand with this sister industry, and the tillable lands which now lie idle shall yield a rich return to the thrifty husbandman. As the commercial and geographical center of this developing region, Helena will expand and grow rich. Already the effects of growth in the Territory during the past five years have made this a city of comparative solidity. The buildings, which are now being erected in great number, are built so as to endure; they are constructed somewhat in view of prospective needs. They would be an honor in many cities of double or treble the population of Helena. But the day is not distant when the wants of the city will cause even finer buildings to go up as many of the old frame landmarks shall disappear, and then we shall see a city indeed the "Queen of the Mountains," as she is now fondly called by her admirers.

Helena had Its First Growth

From the tide of miners who came to Last Chance gulch in consequence of gold discoveries in 1864. There were many bars and gulches which were yielding good returns to placer miners at that time in the Territory of Montana, the richest being in the vicinity of Virginia City, 125 miles or so south of the present site of Helena. But in 1864 and 1865 the excitement was transferred to this region, and the present city, as the center for all, became an established depot for supplies. In 1874 the capital of the Territory was removed here from Virginia City. It is, by all odds, the most suitable city in the Territory for the seat of government. It is the present center of population, and quite as accessible as any other place which might be chosen. Being the capital, there are located here many institutions or affairs of Government, which draw in the citizens of the Territory, so that the floating population of the city is comparatively large. This tendency is increased by the mining developments of the surrounding country, so that we see here numerous hotels, most of which are doing a good business. Among these, the Cosmopolitan stands chief and best. It is central and well kept. The city is incorporated, having a mayor, ward supervisors, and all customary city officials. The site of the city is not advantageous to fine and regular streets, being upon either side of Last Chance gulch, and extending over beyond Dry gulch, each with shelving banks. But the streets are fast being graded, and now there are three or four main avenues extending out into the valley below the city which are fine drives and which are rapidly being lined with neat and tasty residences. The city lies well up under the mountains, and overlooks quite an extended valley to the north, called the Prickly Pear valley. The altitude of Helena above sea-level is 4,266 feet. The immediate country surrounding is not highly productive in an agricultural way, but could be made so by irrigation. The wheat lands tributary to the city are mostly in the Missouri valley, some ten miles to the eastward, where, for many miles up and down the river, upon the bench-lands, a fine grade of wheat is raised. The mining regions which are also tributary to Helena are not close at her doors, but they are still so situated that they most naturally look to her as their supply point.

The present population of this city is said to be 8,000, which we should think a very reasonable estimate. From the statistician of the *Independent*, we learn that, in the matter of building, Helena had, in May last, buildings and improvements in process of construction which would reach in value about $600,000. The same authority estimated that fully one million dollars would be spent in building operations during the season. The statement seems plausible, and speaks volumes for the enterprise of this growing city.

The city has three times been devastated by fire, so that the official seal of the corporation very appropriately bears the phœnix, rising from her ashes. There are abundant educational advantages; in the way of public schools and colleges, and each of the leading religious denominations owns a church edifice. Several of the fraternal orders are also represented. Manufactories are growing, and already there are numerous well established institutions in this line. Tatem & Ellis have in operation a foundry and machine-shop, which was established in 1867, and which now manufacture complete plants for mining operations. They employ from 15 to 20 men regularly. They manufacture quartz-crushing, amalgamating, concentrating, mining and general machinery, iron and brass castings, etc., all from original patterns, and of first-class style. A flouring mill with a capacity of turning out 100 barrels per day, is now being erected by Sanford, Evans & Co., in the lower part of the city. The machinery will be the best style of roller mill that could be found, manufactured by the Pray Manufacturing Co., of Minneapolis. The idea is to make a home market for wheat, and to find a home market for flour. Gebauer & Yergy, have a planing mill on lower Main street, where they manufacture sash, doors, and blinds and where they are kept very busy at present in preparing builders' material for use in the construction of the large number of structures which are now going up. Stedman & Banes have a foundry and machine-shop in the same vicinity, where they employ from eight to ten workmen in repairing and manufacturing machinery. At present quite a specialty with them is iron fronts for buildings, some of which they have shipped to Butte and elsewhere. They are soon to go into new and enlarged quarters. Gas works, to supply the city with gas, are also being constructed. The electric light is already placed in many of the leading business houses, and the busy part of the city will soon be lighted by this means. All will be supplied by generating apparatus in a good-sized building near the center of the city. A United States assay office, where bullion is bought for the Government, as at the branch mints of the country, is established at Helena, and does a considerable business. During 1883 this establishment received about $800,000 worth of gold and silver, all but one-sixteenth of this amount being in gold. Since beginning operations in 1877, it has received about $5,000,000 worth of these metals, nearly four-fifths of which has been in gold. Helena is the seat of the United States Land Office for the district in which she is situated. Here some $100,000 is taken in annually from the sale of Government lands. Helena is also the county-seat of Lewis and Clarke county, which is an irregularly shaped county running far to the north of its seat of government, but sparsely settled in its northern portion. The city has a commodious opera house, and other ample means for the amusement of her people. It has lately been, and is each year, the seat of a Territorial fair, which brings here for exhibition some exceedingly fine stock and agricultural productions of considerable merit. The stories which are now being circulated about Montana potatoes almost throw in the shade those which we see every year about the beets of California. Many potatoes have been plowed up the present season which weigh 2½ pounds, and one gentleman tells of a field in Meagher county, where the crop, after it was dug, literally covered the surface of the ground. Nineteen of the larger of these potatoes weighed about 20 pounds.

The Mining Districts Tributary to Helena

Are not by any means confined to the county of which she is the capital. We cannot mention in detail the developments and prospects of these tributary regions. Below will be found an account of our observations in two or three of the districts in question. Some placer workings are still maintained in the locality of Helena, and even within the very limits of the city three or four gangs of men, with hydraulics, are washing the gravel of Last Chance gulch. We presume some $100,000 are yielded each year from hydraulic and placer works in this immediate section of Montana. From trustworthy informants we learn of recent valuable discoveries and prospects of quartz leads in the Red Mountain district, some 15 miles southwest of Helena. No reduction works are yet adjacent to this region, but the richness of the leads will probably soon cause improvements of this kind to be put in. There are also the Ten Mile district, the Russell district and the Vaughn mines, all lying in the same vicinity, where prospecting has proved the existence of numberless ledges of valuable ore.

Marysville and Gloster, M. T.

No description of Helena would be complete without a notice of the mines at the two points named in the above heading. The places are reached by stage, and lie in the mountains some 20 and 23 miles, respectively, in a northwest direction from Montana's capital. The road leading there crosses diagonally the plain back from Helena, and some seven or eight miles from town passes over a low divide, and at 12 miles distant reaches the valley of Silver Creek, at the ancient placer mining camp of Silver City. Here stage horses are changed, and an additional (a third) span hitched on to carry the load up the heavy grade which follows along the creek. All the way to Marysville there are observable the old workings of a placer camp. The entire bed of the stream has been washed over, and the promiscuous heaps of gravel lie about as the miners left them some 15 years ago. There is a little placer mining still done by Chinamen near Marysville, but no very great returns are received. The road up the creek is a fairly good one, and the staging therefore quite easy. Marysville is reached in about four hours. The little town lies at a point where the creek canyon is narrow, and on the opposite side of the stream from the famous Drum Lummon mine, which is virtually the support of the place, and the one cause of its springing into existence. The Drum Lummon is a mine originally discovered by Thomas Crnse, now of Helena, who sold the property a year or two ago to English capitalists, who have since erected here extensive and excellent works. At present some 125 men are employed about the mine and the mill, all being under the supervision of Geo. Atwood, Esq., acting superintendent, who has his residence close to the mine. The capacity of the mills of the company is 60 stamps—10 stamps in the old Cruse mill and 50 in the new mill, 20 of which were started in April last, in an addition to the mill completed at that time. The ore worked is almost entirely gold-bearing. It is a free-milling ore, and is handled quite rapidly, some 160 tons being crushed each day. The process is simple, but the machinery about the mill is the most perfect of its class. The 50 stamps and 24 amalgamating pans, besides necessary settlers, are run by one engine, which is itself a beautiful machine. It is from the Union Iron Works, San Francisco, with the O'Neil and Scott cut-off, and to say that it does its work beautifully and well would be faint praise. When steam was first let on from the throttle valve it started in motion like a veteran, and has required no adjustment since. The ore is brought from the mine both by way of a tunnel and a shaft. The latter descends into the mine a little distance up the hillside from the mill, the ore being brought down to the dump or chute by means of cars upon an elevated tramway. The tunnel cuts the lode at 400 feet from the surface, from which level, and at the 130-foot level, most of the ore is taken. The tunnel itself is 1,200 feet long. All operations at the mine, in the way of hoisting, drilling, etc., are done by means of compressed air, for which one of the largest air compressors ever made is in use at the mill. It is of 500 horse power, and has its own special engine. This, too, is the work of Prescott, Scott & Co., of S. F. The Drum Lummon is a grand piece of mining property, and it is to be hoped that the present plant may be kept in steady operation for years to come.

The Gloster mine gives name to the little settlement near it. The place is reached from Marysville by crossing over two high hills and through a deep gulch between them. The mine and mill lie about half a mile apart, upon the sides of another steep hill. Ore from the mine is carried down to the mill on a tramway, the loaded car raising in its descent the empty car that had preceded it. This tramway is fully half a mile in length. At the mine, practical operations are under the supervision of Thos. L. West, a miner of considerable former experience in California and Arizona. The shaft has penetrated to a depth of 400 feet. There are levels at each 100 feet, and these are well opened out. The ledge is clearly defined and easily worked. Some 180 to 200 tons, the capacity of the mill, are raised each day, and the engineer is kept tolerably busy in the work of hoisting and lowering. The mine employs about 60 men, and the mill about 40. At the latter place Mr. D. M. Sutton is foreman in charge, who also is a former worker in the mines farther west, having spent several years in Nevada, and being a resident of the Pacific coast since 1863. The machinery at the Gloster mill is very complete and fine. For the stamps there is in use a Corliss engine of 150 horse power, while for the amalgamating pans, settlers, etc., an O'Neil engine, from the Union Iron Works, is used. Each does its work smoothly and well. Sixty stamps are in operation, which are kept lively at work to crush some 200 tons of ore per day. But the ore is brittle and easily worked. Like that of the Drum Lummon, it is gold-bearing. After being crushed, and lying ready to be charged in the amalgamating pans, it resembles closely the sands of the seashore. The Gloster is a profitable and well managed mining property, and has an era of great prosperity in store for it.

The towns of Marysville and Gloster with the mines and mills there located, are important adjuncts to Helena's prosperity. She is their natural supply point, to which they send for all needed supplies, almost as if they were located at her very feet.

Wickes, Corbin and the Comet.

One of the chief mining interests centered at Helena is that of the Helena Mining and Reduction Co. The main works of this company are at Wickes, some 20 miles southwest of Helena. To that point a branch line of the N. P. R. R. has been extended, following up the canyon of the Prickly Pear, into the center of a very mountainous region. At Corbin, some four miles back from Wickes, are concentrating works which treat the ore from the Alta mine, which is itself a mile and a half from Corbin. Both mine and concentrator are the property of the company above named. The concentrator turns out for the reduction works at Wickes about 150 tons of concentrates per day, which are hauled to the latter place by cars. It is one of the finest pieces of property in this line that there is in Montana. The plant was mainly supplied by the Fort Scott Machine Works, and includes the sizing jigs and Retinger tables of this system, though there are also in use some Frue vanners. The works are under the able management of Mr. M. L. Comisky, inside foreman, and Mr. Wm. Winlaw, yard foreman, both, faithful and able workmen.

The concentrating works at the Comet mine are capable of treating some 80 tons of ore per day. This mine is about four and a half miles from Wickes, and from the mine to the concentrator the ore is soon to be brought over what has been noticed by the PRESS as one of the longest tramways in the world, viz., two and a half miles. Mr. C. Huson of Denver has been superintending this tramway, and is yet on the ground. Mr. E. D. Reynolds, of Butte City, will, probably, after the departure of Mr. Huson, represent the interests of the company having in hand the construction of this tramway; and if it proves the success anticipated, we have no doubt he will be called upon by various corporations to give estimates on similar works elsewhere. It is among the probabilities that the ore from the Alta will be taken to Corbin by a similar process as that at the Comet. The concentrates from the latter mine are taken by teams to the smelters at Wickes. Thus it will be seen that the reduction works at this place handle about 230 tons of concentrates per day. To do this there are two large blast furnaces, six Bruckner cylinders, eight calcining or reverberatory furnaces, 25 stamps, six amalgamating pens, two settlers, etc. Generally speaking, the ores from the Comet and the Alta are tolerably low grade and very base, carrying gold, silver, copper, zinc, lead, antimony and arsenic, so that concentration was found necessary to make the reduction of the ores profitable. Indeed, before the present management assumed control, over a million dollars had been lost in the enterprises of the former company or companies. Now, by careful concentration, an economical and thorough treating at the smelters, a different result is obtained. The total yield in bullion since the company began operations, about the first of January last, has been $806,604, and during May there was a phenomenal yield of $155,000. From these figures it may be assumed that the Helena Mining and Reduction Works are returning a profit to the stockholders. The total number of men employed about mines, concentrating works and smelters is from 380 to 400. The officers are: S. F Hauser, Pres.; D. C. Corbin, Vice-Pres. and Treas.; J. W. Buskett, Sec.; John Longmaid, Supt.; John R. Gilbert, Asst. Supt. No matte is shipped from Wickes, but the result of operations goes out entirely in bullion, and is shipped to Newark, N. J. This bullion contains a large percentage of lead and other base metals. As one sees the slag drawn off from the blast furnaces, and notices the sure indications of other metals, notably zinc, which are thrown away with this refuse, he cannot but regret that the processes are not thorough enough to save all of the valuable minerals which the ores would yield. The day may not be far distant when in Montana this will be done.

The Gregory and the Elkhorn.

These two properties, under separate management, with headquarters at Helena, were not personally visited by our reporter. From Mr. C. L. Vawter, Secretary and Manager of the latter property, we learn that the average production of bullion per day is $500, obtained from a run of 12 tons. The mill has 10 stamps. The process of reduction is the chloridizing system, and the metal yielded is silver. The paying ore is taken from the 300 foot level in the mine, though the shaft reaches a depth of 360 feet. About 35 men are employed. The machinery has been in operation since January last. Geo. O. Kilbourne is the Superintendent at the works. This mine is 45 miles from Helena, Jefferson City, on the Wickes branch of the N. P. R. R., being the nearest railroad point. We did not take statistics concerning the Gregory at Helena from the gentlemanly Secretary, Mr. A. F. Seligman, feeling certain when there that we should visit the mine from Wickes. But at the latter place we were disappointed in our contemplated trip, and shall therefore be obliged to pass this valuable property. Some additional notes are given in another column.

CUMMER ENGINES.—A short time since, the West Shore Railroad Co. sent out requisitions to the different engine builders, to which they had a full response, and, in the face of much lower prices, they have just placed their order for a 300 H. P. Cummer engine. The engine is to supply motive power for their large shops at Frankfort, N. Y. The Cummer Co. felt quite elated at receiving this order, as it comes in the wake of an order received from the Pennsylvania Railroad Co., under similar conditions, and under just such as severe competition. The engine for the latter Co. has just been shipped, and will be used in their extensive new works at Indianapolis, Ind. The Cummer Co. has also just been favored with orders for a 170 H. P. engine for the Hadley Cotton Mills, Holyoke, Mass.; a 130 H. P. engine with outfit complete for the Upton Manufacturing Co., of Battle Creek, Mich.; and two engines, 70 H. P. each, for the Citizen's Electric Light Co, Akron, Ohio. Cummer engines have just been started at the Louisville Exposition, St. Louis Exposition, and in the flourishing mills of Cheesman & Drieshach, Tonganoxis, Kansas. The above company report work on the three large Ballantine refrigerating machines for Joseph Heusler, of Newark, N. J., progressing very rapidly, their orders still on the increase, and a splendid outlook for future business.

MECHANICAL PROGRESS.

Smelting and Casting Iron.

A German journal, the *Metallarbeiter*, says: The metallurgical processes employed in the extraction of iron, produce a metal which contains carbon, silicon, manganese and other substances. Pure iron, having a very high fusing point, is not well applicable to foundry purposes; the material we have to examine is iron combined with carbon. The presence of carbon, it being combined and disseminated as graphite through the iron, causes a lowering of the fusing point. When pig-iron is molten in a cupola furnace, the air comes in contact with particles of the liquid metal and the carbon thereof; the metal is partly decarbonized. The impurities, silicon, manganese, and a small quantity of iron, are converted into oxides, producing the slag.

Other products of oxidation, carbonic oxide and iron oxide, are dissolved in the molten iron. The air blown into the furnace generally contains aqueous vapor, and by its action upon burning coke hydrogen is generated. Molten iron, possessing the property of dissolving three times its volume of hydrogen, as has been shown by latest investigations, is thus charged with carbonic oxide, hydrogen and iron oxide. On the cooling of the metal, the gases are emitted. They are the causes of the spongy, pumice-stone-like surface structure observed on solidified metallic masses.

Iron being molten at a low temperature, and then tapped off and poured into molds, liberates the dissolved gases within the mold. The structure of such a casting exhibits the presence of cavities and a high degree of porosity. Such cavities have pease-like shape near the surface, and assume that of a sphere toward the center of the metal; they are sometimes connected with each other by small channels. When heated more rapidly and far above its fusing point, iron becomes more applicable to foundry purposes. The molten metal remaining for some time in the ladle and being agitated by the aid of a bar before it is poured into the molds, permits a free elideration of dissolved gases.

The property of iron of absorbing gases and iron oxide is increased by remelting of iron; for the homogeneous castings iron must be used which has not previously served the same purpose. The spongy structure of a casting is also caused by the molding material. When the orifices of a mold become gradually filled with molten metal, the escape of gases depends on the physical nature of the molding material. The latter containing moisture and organic substances generates aqueous vapor and other gases. These cavities are covered with a film of oxidized metal, while those produced by dissolved gases have a bright metallic surface.

The difficulty involved in the casting of homogeneous articles is partly overcome by the use of a suitable porous sand. Another class of cavities is that called druse. The cavities of a druse are studded with iron crystals of a dendritic form. The formation of these cavities is caused by an abnormal shrinkage during solidification. Another phenomenon generally called sucking must be assigned to the same cause. It is generally observed on parts of castings where a large quantity of metal has been collected. It is therefore advisable in the manufacture of castings to give them an equal wall thickness, which has the advantage that the tension is most equally distributed throughout the mass. On the cooling of the liquid metal within the mold, the particles which are in contact with the mold are sooner solidified than those more distant, and promote a motion of the liquid material from places of greatest to such of less accumulation, thus forming druses.

Bessemer Steel for Edge Tools.

How nearly Bessemer steel can be brought to crucible in its usefulness for tools is a matter than which there are few more important to the machinery engineer. The advance of the Bessemer metal in this respect means to him a considerable saving of money. Rapid advances are being made in the quality of the Bessemer metal. This is amply illustrated by what is now going on at the colossal establishment of the Barrow Hematite Steel Company. In addition to an extensive output of rails, fish plates, railway ties and axles, square, round and flat bars, hard and soft steel blooms and billets, suitable for steel and tin-plate making, etc., and such like heavy production, the company are regularly making upward of 1,000 tons per week of "special steel," for purposes for which only Swedish Bessemer charcoal and best scrap iron were formerly considered suitable. This special steel is worked up in various parts of the Kingdom into roll-turning and lathe-turning tools, chisels, files, shear blades, rail drills, rail punches, shear steel for welding to iron, miners' drills and tools, picks, shovels, hand hammers, roller, bar and cotton spindles, locomotive engine, wagon, carriage, coach and furniture springs, bolts, nuts, rivets, pit ropes, telegraph, crinoline and corset wire, umbrella frames, wire for musical instruments, etc.; it is even claimed that the steel is suitable for the manufacture of cutlery and razors, and is to some extent being used for these purposes. Touching the extent to which the articles answer, it may be mentioned that an inch pit chain, made from a soft sample of this special Bessemer make, withstood a breaking load of 35.63 tons elongation, 6 inch or 18 inch. The welding had been done by a smith not accustomed to chain work. This is very encouraging to machinery engineers, with whom Bessemer steels are gaining favor to the supplanting of cheap cast steels.

WIRE WOUND GUNS. Experiments are still in progress for perfecting this description of guns and the Ordnance Department of the Army are expecting important results from the machine now ready at the Watertown Arsenal for winding wire on guns of 10 inch caliber. The present machine, the invention of Dr. W. E. Woodbridge, is a great improvement on the former attempts in this direction. Some years ago, it appears, the Government made some experiments in the same direction by winding the tube with ¼-inch steel bars and filling the interstitial spaces by running in metal bronze. The Getty Ordnance Board made some important practical tests of this process of gun manufacture, but through firing the gun to extremity, ruptured it at a weak point in its construction.

The Woodbridge system of manufacturing wire-wound guns has thus far been a success. The trials will be made with steel tubes from the Midvale Works, Pennsylvania; the Otis Iron and Steel Company, Cleveland, Ohio, and the Whitworth Works, England. The experiments under the Ordnance Department of the Navy for 6-inch guns have demonstrated the superiority of American steel.

MACHINERY. — The World's Exposition awarded a contract on the 9th of last month for 10,000 feet of shafting, with couplings, hangers and pillow blocks, for Machinery Hall to a Pittsburg firm. Machinery Hall has seven lines of shafting with a total length of nearly two miles. Twenty-four engines, furnishing 5,500 horse power, parked in the central space, 50 feet wide by 300 feet long, will drive the machinery. About half of the boilers necessary have been secured. The total capacity of all of them will be 6,000 horse power. Pumps supplying 4,000,000 gallons of water daily from the Mississippi river have been furnished. The Cummer Engine Company will supply the cold storage plant for the immense meat, fish and fruit display; filter and cool ice water for all the buildings and fountains to 40 degrees, and furnish the Exposition with all the ice required. Drinking fountains for visitors are being provided throughout the buildings and grounds. A thorough plan for the water supply for the buildings and fire department has been adopted. —*Commercial World.*

TACK-MAKING MACHINE, AN IMPORTANT INVENTION.—A Connecticut man has perfected an automatic machine for making upholsterers' tacks, and is producing the goods at Torrington. These tacks have so far always been imported, and the secret of the English manufacture is not known. Various attempts have been made in this country to devise machinery, for producing these goods, but resulting in failure. One firm sank $20,000 in the endeavor. Another firm 15 years ago, partly succeeded, but failed financially. The new machine turns out perfect tacks at the rate of 150 per minute. An average day's work is 60,000. One man can take care of four of these machines. By using different dies the heads may be either round or cone-shaped, and several sizes can be made. After shaping, another machine polishes the face of the metal. The immense quantity used is shown by the fact that an importer in New York receives eight or ten million of these tacks monthly.

THE STEEL NAIL QUESTION.—Reports from West Virginia, where the manufacture of steel nails has been commenced, indicate that the steel nail question has begun to assume a serious aspect. The amalgamation is out in a card to-day, in which it calls upon all nail consumers to reject the steel nail and leave it on the hands of the manufacturer. It asserts that the iron nail is better, cheaper, and in every way more suitable than the steel nail, and denounces the latter as a direct stab at organized labor. The manufacturers have introduced it for the sole purpose, the card claims, of breaking down the amalgamation and forever subjugating iron trades unions. If the steel nail is taken up by our local mills it will throw out boilers, heaters, rollers and laborers to the number of 3,500, and put them on an already overstocked labor market. There is trouble ahead, and much anxiety is felt in business circles here.

LOCOMOTIVE WORKS. There are now in the United States 16 locomotive works, not including the shops owned by railway companies. Pennsylvania has five of these, New Jersey and Massachusetts, three each; New York, two; and Rhode Island, New Hampshire and Maine, one each. These works give employment to 14,000 men, and every year add about 2,600 locomotives to the 20,000 now in use. The locomotive engine of to-day is a marvel of simplicity and beauty. Probably no other machine extant shows such progress toward perfection, within the last 50 years.

SHIP SHEATHED WITH GLASS.—The *Popular Science Monthly* records the interesting fact that an Italian ship has been sheathed with glass plates, cast like iron plates, so as to fit to the hull, to take the place of copper sheathings. The joints of the plates are made water-tight by the use of water-proof mastic. The advantages claimed for glass over copper are its insensibility to oxidation and its exemption from incrustation.

SCIENTIFIC PROGRESS.

Is There a Snow Cap on Venus.

The Rochester *Democrat* reports an interesting observation by Mr. I. P. Guldenschuh, of the Rochester observatory, with a seven-inch silver on glass reflecting telescope. On the 17th of August, Mr. Guldenschuh saw in profile on the convex edge of the crescent a brilliant white lenticular spot. This was cut off by a regular curve from the convexity of the crescent. The line of demarkation was sharply defined. He said he had seen nothing like it except the snow cap on Mars. We suggested to him that in all probability he had seen a snow cap on Venus, although at the time we had seen no report of such an observation by any astronomer. This bright, lenticular spot cut into the broadest portion of the crescent, showing that, if it were a polar snow cap, the hole is now turned diagonally toward the sun. This was not very surprising, as the difficulties attending the determination of the axis of rotation are very great, and to this may the inclination of the axis of Venus to her orbit not accurately known. It occurred to us, says the *Democrat*, that Mr. Guldenschuh may have hit upon a discovery of importance, and immediately consulted the authorities upon Venus. We found that the estimated inclination of the axis of rotation is not far from 75°, a fact which would fit the observation. Judging the present direction of the axis, from Mr. Guldenschuh's observation, and tracing the planet back to the time before inferior conjunction, it was seen that there must have been winter at the pole now visible before conjunction, and that summer is now approaching.

Upon consulting Webb's "Celestial Objects," we found in the appendix the following statement, which seemed to explain Mr. Guldenschuh's success: "Much attention has of late been paid to this planet, especially since the silvered reflector has been found peculiarly capable of defining it." In the same appendix it was learned that the bright spot had been seen by Browning on the 15th of March, 1868. It was on the circular limb, about 80° from the south coast or horn. Browning described it as "so luminous as to show projection like the snow on Mars." This confirms the accuracy of Mr. Guldenschuh's independent observation. We are inclined to believe that both observers saw a polar snow cap. With the great inclination of the axis of Venus, one pole must be in darkness for six of Venus' months, and there is reason to believe that there is a great deposit of snow and ice during this period. If the inclination be 75°, the tropics are but 15° from the pole. We trust that Venus will be carefully examined. Perchance the spot seen by Mr. Guldenschuh may be visible in the many refractors owned in this city.

The Uniformity of Nature's Laws.

An interesting lecture was delivered recently before the Vienna Academy of Sciences, by Dr. W. Meyer, on the above subject, in which the lecturer explained that the latest astronomical discoveries showed very plainly the system upon which the universe is founded. Respecting the qualities of light, the professor explained that it passes from all the stars to the earth with the same degree of velocity that the earth's light travels to the stars. The results of spectral analysis were stated as follows: The analysis of the sun's light to the original shades of colors has shown us twenty-five chemical elements, which all exist on our earth also, and no wholly unknown matter has as yet been ascertained. The sun is composed of the same materials as the earth. The sun may be considered the mother of the earth. But the distant fixed stars are of a composition similar to, and in many cases identical with, that of the sun. The red stars are heavier than the white. Then the stars which appear as new to us, not having been observed in the heavens before, develop a glowing atmosphere of hydrogen around themselves. The nebulæ in the firmament are caused, probably, by hydrogen and nitrogen; but it is possible that they are composed of a form of gas unknown to us. The warmth of the stars has also been ascertained. Red stars are the warmest, green stars the coldest, while the white stars have a medium temperature. The laws of gravitation are common to the whole system. This is proved by the so-called double stars, which revolve around each other by the same laws which regulate the movement of the earth around the sun. The law of gravitation is so plainly visible that the satellite of Sirius was not discovered until it had been ascertained that there was an attraction which worked its influence upon the star. The uniformity of nature's laws and the similarity of the materials composing the universe are a sufficient proof that there must be organizations similar to that of our system all over the universe. We see the results of these laws in the world we inhabit, and there can be no doubt that the same powers and the same materials have produced organizations similar to that of the earth in millions of other places, although we can but philosophically suppose their existence, not practically prove it. We must imagine that the earth is inhabited by a small family forming part of the great nation which peoples the universe.

THE LIQUEFACTION OF AIR.—M. Olszewski has contributed to the *Comptes Rendus* some of his further observations upon the temperature and critical pressure of air. He says he has obtained six cubic centimeters of air compressed into the liquid form. This air did not contain carbonic acid or aqueous vapor, and was allowed to evaporate in a vacuum, and also under atmospheric pressure. A very low temperature was thus produced, as low as 205° C., being observed when the evaporation took place *in vacuo*. It appeared, however, that the recorded temperature of the liquid air at the critical point was not so low as that of its constituents, oxygen and nitrogen, separately. Consequently, M. Olszewski was led to think that at the critical pressure the components separated: nitrogen evaporating in the larger proportion. Therefore, although air is a very convenient refrigerant, for various practical reasons M. Olszewski is disposed to prefer the use of nitrogen in his researches upon the liquefaction of hydrogen, as he thereby hopes to be able to command temperatures even lower than that given as the evaporation point of air in a vacuum.

OIL ON THE SEA-DEVICES FOR UTILIZING THE PRINCIPLE.—The practice of pouring oil on troubled sea water has led a Scotchman to design a shell which can be fired from a mortar, and which in bursting spreads the oil it carries over the sea. The shell is fitted with two fuses, which are set alight by the explosion in the gun, and burn although the shell is under water. On the bursting of the shell the oil spreads over the surface producing smooth water. The device was recently tried with success; the object being to still the sea between two ships in order to let a boat pass from one to the other. The shell fired from the ship carrying it (and every ship might carry a few), burst between the vessels, and calmed the waves with the oil.

Another mode of utilizing the principle has been devised which consists of an automatic wave lubricating life buoy. This buoy is furnished with a seamless-brass reservoir running entirely around the inside, and oil is filled in through a hole in the top which is then covered by a screw cap. On each side of the upper part of the oil tube is placed a rose similar to those placed on sprinkling cans, so that when the buoy is hung upon the vessel's stern no oil can escape. The moment, however, that it is placed horizontally the oil begins to escape and covers the water with a thin film of oil, which squirts out rapidly on every side until a large circle is formed, within which the person who has fallen overboard may rest until rescued.

FOR THE ADVANCEMENT OF SCIENCE.—There are said to be in existence, in this and other lands, 1,000 scientific societies. Some of these are devoted to special departments of investigation, while others aim to foster all branches of learning; some, again, are exclusive, being limited to a few individuals of ripe attainments, while others are more popular in their constitution, and aim at assembling into one organization all the scientific men of a State or nation. Hand-books have been issued giving the names of both American and European scientific bodies, and also, as far as practicable, a list of scientists in all parts of the world, with a brief statement of the specialty of each. The two great and leading associations of this character are the British and American, each avowing its aim to be "for the advancement of science." These bodies have just been fraternizing for the first time in their history at Montreal and Philadelphia. The British Association has been in existence 54 years, the American 33.

LIGHTING MILLS BY ELECTRICITY.—At a recent meeting of the Rhenish-Westphalian millers, Mr. Pfankuck, of Cologne, the electro-technologist read an interesting paper on "Lighting Mills by Electricity." The two lights in use for this purpose in the large mills in Europe are the arc and the incandescent flame, and Mr. Pfankuck pronounced the latter to be the only one appropriate for mill lighting. The arc light has to be opened at intervals of a few hours to renew the carbon, whereas the incandescent light requires only the occasional wiping off of the mill dust from the globe, and permits a division of the currents, allowing one or more lights to be extinguished without affecting the others.

THE ELECTRIC LIGHT ON PLANT GROWTH.—Experiments upon the action of the electric light on plants, at the Palace of Industry, Paris, have resulted less favorably than was expected. The naked rays from the electric arc were found to be injurious; after passing through glass they ceased to have any hurtful action upon the plants, but their efficacy was not great. Illumination at night is not fatal to plants, but no proof has been obtained that it is really beneficial.

THE SUN'S LIGHT.—M. Trouvelot, of the observatory of Meudon, after observing the shadows thrown by the faculæ on the penumbræ of sun spots, suggests that the brilliant light emitted by the faculæ, and perhaps the entire light of the sun, is generated at its surface, the presence of the coronal atmosphere being perhaps necessary for its production.

CITRIC ACID AS A DISINFECTANT.—According to the *Journal d'Hygiene*, citric acid is a most powerful disinfectant, preserving meat from putrefaction, and proving rapidly fatal to septic microbia. The soluble citrates have no similar action.

MINING AND SCIENTIFIC PRESS.

A. T. DEWEY. W. B. EWER.

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Passing Events.

A new mining district, called Gold Hill, has been found in New Mexico, which is attracting considerable attention, and many men from the neighboring regions are flocking in that direction. A description of the find is given in our Mining Summary on another page.

The Locomotive Engineers have been in session in this city during the week, and have combined pleasure with business, taking various excursions and indulging in sight-seeing, as well as looking out for the business of the Order.

The Montana mines are looking up very rapidly, and last week the largest silver shipments that the mines of Butte ever made in the same space of time were sent from that camp.

COEUR D'ALENE.—The general impression among the best informed visitors to the Coeur d'Alene mining district is about as follows: There are many placer and quartz claims that would prove rich and valuable if capital could be interested to develop and work them. A few placer claims are now paying well, with indifferent methods of working. Considerable litigation has unsettled titles, and financially embarrassed miners, who have been implicated. The region is full of those who came in with greater imaginations and hopes than heavy purses, consequently there are proportionally more "dead broke" citizens, probably, than in any like area in the nation. But there is considerable faith, in Spokane Falls and elsewhere, in the ultimate value of mining property in Coeur d'Alene, and at present, parties with means and with settled plans, are quietly investigating their purchases there, with the intention of making the best of them.

Oxidizing and Chloridizing Furnace.

Mr. John B. Brett, of Oakland, has patented through the MINING AND SCIENTIFIC PRESS Patent Agency, an improvement in oxidizing and chloridizing furnaces, designed for the continuous operation of oxidizing, desulphurizing and chloridizing of ores. It consists of a vertical flue or stack, into which the ore, in a pulverized condition, is fed by any suitable means, and falls downward through the heat and flame, which enter the stack through a passage from the fire-place. From the foot of the vertical flue an inclined flue extends downward at a sufficient angle to secure the flow of the ore down to the discharge-opening, which is narrowed so as to allow the ore to flow through, the space not being large enough for a current or draft which would carry off the dust.

The cylinder is supported the usual way, on wheels or rollers, so as to be rotated, and stands at a slight angle, so the ore moves slowly and discharges at the end farthest from the inclined flue, into a pit. The fire-place at the same end communicates with the cylinder and supplies the requisite heat to assist in chloridizing. Another fire-place connects by a flue with the lower part of the inclined flue to supply heat at that point. From the end of the cylinder nearest to the flue an inclined passage leads downward into the dust chamber, the bottom of which inclines sharply to a spout within which a screw conveyor revolves, and carries the dust into a receptacle, from which it is lifted by a bucket or elevator and is discharged into a hopper. A pipe or passage reconveys the dust from the hopper into the lower end of the inclined flue in case it has not been completely chloridized. If it is desired to settle the dust more completely within the chamber, transverse partitions may be fixed therein, having an open passage around their alternate ends, through which the dust may travel from side to side as it passes toward the rear of the chamber.

At the point where the inclined flue and cylinder join, there is a hopper with a passage leading into the flue, by which the ore may be supplied with salt, the salt and ore entering the cylinder together, where they are mixed by the rotary motion of the cylinder.

In order to save fine dust from the upper part of the stack, a passage opens from it into the upper part of the dust chamber, which extends up nearly to the top of the stack at each side. The lower end of the vertical portion of the stack is narrowed at a suitable point the same as the inclined portion is narrowed at its discharge end. The dust chamber, which may extend up both sides of the stack, has an opening from its upper end into the stack, and as the inclined passage leading down into the dust chamber, and the passage for the upper part of the stack to the dust chamber are open, while the stack is narrowed at certain points above and below, as described, the draft through the cylinder from the lower fire-place will pass through the lower passage, and carry the dust from the cylinder into the dust chamber, while the draft from the upper fire carries the dust through the upper passage into the same dust chamber. The dust will settle to the bottom of the chamber, and the heated air and gases of combustion will pass back into the stack through a suitable opening above these passages, and these keep up a sufficient draft.

Colville Mining District, Montana.

While at Spokane Falls, our correspondent heard much said about the above named district, in the valley of the Colville river, some sixty miles northwest of Spokane. The region which prospects well is of considerable extent, but there has been little done in the way of development, except upon one ledge. This work is being carried on by a Spokane company, known as the Spokane Mining and Smelting Co. They have tested the ledge at points for 200 feet up and down the mountain side, and find the ore uniform in quality and appearance, in each instance. The ore seems not unlike that of the Comstock lode, at Virginia City, Nevada. The different assays average in value about $50 per ton in silver. The ledge is from 15 to 20 feet in width, and the ore, generally speaking, easy to work. Messrs. Smith and Squires, of Spokane, are the active members of the company owning this property. A town has already been laid out in the Colville district, called Argentum, and different establishments in this section of the Territory are planning to move upon the ground next spring, or earlier. There are fine roads into the district from Spokane, and if present indications are borne out as prospecting and work continue, there will be quite an influx of miners into that region next year.

Technical Society of the Pacific Coast.

The regular monthly meeting of this vigorous young society was held on Friday of last week, Col. George H. Mendell, U. S. A., in the chair. The propositions for membership were W. H. Milliken and J. H. Clemes.

A very interesting paper, "On the Flow of Artesian Wells," was read by C. E. Grunsky, of Sacramento. From experiments made in connection with the measurement of many wells in the San Joaquin valley, Mr. Grunsky has established an empirical formula for these flows, which will be found useful in all ordinary cases. The paper will soon be published in the Transactions of the Society.

Mr. F. Gutzkow spoke of the utilization of wood pulp, and showed the fabric, resembling cloth, made from it.

The President stated that the society had been invited by the Telegraph Hill R. R. to inspect the workings of their cable road.

Mr. Gutzkow described an artesian well in Alameda county, within a few feet of tide-water, which flows perfectly pure water, but is affected by the tide. It flows double the quantity at high water that it does at low. There is no apparent connection with tidal waters. There is considerable soda in the water, as, in fact, it flows about 160 pounds of soda salts per day.

Mr. C. C. Wolcott, of Mare Island Navy Yard, described a somewhat similar experience in a well sunk on the marsh lands of Mare island.

Mr. Poett knew of several of such wells which rise and fall with the tide, at San Mateo. One sunk within eight or ten feet of the bay flows over at high tide, and at low water is ten or twelve feet below the surface, the tide only rising and falling some five feet.

Mr. E. J. Molera described the peculiarities of the eight artesian wells on his ranch in Monterey county. There is no leakage in the pipes, and the shores are very steep. Water was tapped at about 110 feet, after passing through a certain clay stratum. There is a difference of levels in the wells, agreeing with the tide.

Mr. Wolcott described the results of artesian well boring at Mare island, where so far they have not been successful in obtaining good water.

Mr. Hermann described the occurrence of artesian wells in Santa Clara valley.

A discussion ensued on the source of artesian water at different places, which was participated in by Messrs. Wolcott, Molera, Poett, and Hoadley.

Volcanic Activity in Alaska.

About two years ago some severe earthquakes were experienced in Alaska, and from the appearance of the atmosphere, it was surmised that there was active volcanic disturbance somewhere in the Arctic ocean. It was afterwards found that a new volcanic island had risen from the sea close to a small island known as Bogoslov in the Behring Sea. The New Bogoslov, as it is called, is very much larger than the old island, and is connected with it by a strip of gravel beach. The old island had an elevation of about 400 feet, and the new island has an estimated hight of 500 feet. Last summer Capt. Healy, commanding the U. S. revenue steamer *Corwin*, sent his officers to make an examination and to attempt the ascent of the new volcanic island, but they were only partly successful. The nature of the ground rendered progress difficult. It was found, however, that there was an immense fissure or canon extending through the island, from which is issuing great volumes of steam and smoke, but the party was unable to get near enough to determine whether there is a true crater or not. The old island, where lifted up by the eruption, shows vertical sides and is entirely inaccessible except to birds. The marks of the marine vegetation which grew near the water's edge, are now high up the side of the cliff.

The *Corwin* visited this volcano on her return trip for the Arctic, about a month since, and Dr. Youman reports that the old anchorage had deepened so that they had to anchor close in shore. While the bottom had thus sunk in places the rear part of the New Bogoslov had perceptibly arisen, although the signs of activity were even less than in the spring. The Doctor ascended the New Bogoslov.

The *Corwin* returned to this city last week from her annual cruise in Alaskan waters. She reports that Capt. Hague of the Alaska Commercial Co.'s vessel *Dora*, saw the Four Mountains of the Alentian chain in violent eruption about the first of September, when on his voyage from Atkta to Unalaska.

Professor George Davidson, of the U. S. Coast and Geological Survey, says this is a group of four islands with volcanic peaks, but has not been in activity in this century except twice. Two of the single islands to the west-south-west have been in eruption in 1817 and 1830. The present site of activity is about 120 miles west-south-west of the volcano Makushin, which was in eruption not very long since, and which Prof. Davidson's party ascended in 1867.

Astronomical.

There will be a partial solar eclipse, on October 18th, visible at San Francisco. The computation for the determination of the time of the first contact, and the point thereof, have been made for the geographical position of the Davidson observatory in this city, and was communicated to the Academy of Sciences at the meeting on Monday evening last, by Prof. Davidson.

The local mean time of the beginning of the eclipse is 4 hours, 20 minutes and 04.5 seconds in the afternoon of October 18th; and the point of the first contact of the limit of the moon with that of the sun is 34 degrees and 9 minutes to the westward of the north point of the sun, or 82 degrees and 45 minutes from the vertex of the sun's limit round to the westward, so that the point of commencement will be just above the right hand edge of the sun. Prof. Davidson's computations have been checked by Mr. C. B. Hill.

The partial solar eclipse is visible only over a limited part of the earth's surface which reaches from the Sandwich Islands on the south to the eigthieth parallel, north of Wrangel Land in the Arctic ocean; and from the eastern part of the Rocky mountain region to the western part of Siberia where the eclipse begins. The middle of the eclipse occurs at San Francisco a very few minutes before sunset, and the latest contact occurs in the Pacific in latitude 34°, longitude 135° west, in about 600 miles west southwest from San Francisco. None of the observatories east of the Rocky mountains will see any phase of the eclipse.

On the 30th of September Mr. C. B. Hill found the Wolf comet in the Davidson equatorial, about 11 hours 30 minutes, local mean time. It was close to the predicted position, as computed by Messrs. Chandler and Wendell. The bright moonlight and the unsteadiness of the atmosphere decreased the light of the comet so much that it could only be made out as a very faint nebulous mass, in which a very minute nucleus could at times be seen when the atmosphere was quiet for a few moments. The bright glare of the moonlight, and the dismounting of the transit instrument have prevented any micrometric measures being attempted.

LOCOMOTIVE ENGINEERS.—The Brotherhood of Locomotive Engineers, in session in this city during the week, held their annual election. The first office to be voted upon was that of First Grand Engineer, Chief Arthur having been elected at the last meeting to serve for three years. The incumbent, T. S. Ingraham, was unanimously re-elected to serve for the next three years. A. R. Cavner, Second Grand Assistant Engineer, was also unanimously re-elected. H. S. Stevenson, of Sacramento Division, No. 110, was elected Third Assistant Engineer; T. S. Simpson, of Birmingham, Ala., Grand Guide, and Delos Everett, of West Philadelphia Division, No. 45, Grand Chaplain. S. R. Spragge, of Toronto Division, No. 70, was then elected to the honorary position of Second Grand Engineer. It was decided by a majority vote to hold the next International Convention of the Brotherhood of Locomotive Engineers in New Orleans, in October, 1885.

MICHAEL DONAHUE, one of the founders of the Union Iron Works of this city, died at Davenport, Iowa, on Wednesday last.

Retorting Silver Amalgam in Vacuo.

About fourteen years ago, on May 31, 1870, Mr. Franz Gutzkow of this city, obtained a patent for an improvement in distilling "in vacuo:" that is, under diminished atmospheric pressure. The novelty was the application of a steam jet and certain pipe connections for producing the vacuum. At present, when the steam jet is frequently used for a similar purpose, there would be nothing particularly new in that. At that time, however, the modification in the construction of the Giffard injector, which admits of producing a vacuum in a closed vessel, was less known, and little, or not at all, practically applied. The process was intended for distilling alcohol. For certain reasons, he never endeavored to introduce it for that purpose.

At a recent meeting of the Technical Society of the Pacific Coast, Mr. Gutzkow read the following paper "On Retorting Silver Amalgam in Vacuo:"

In August, 1873, however, I published a paper in the MINING AND SCIENTIFIC PRESS, recommending the principle for the retorting of amalgam. I had in view to retort at a much lower temperature than usually required, avoid the leakage of quicksilver fumes, and, in the case of a very coppery amalgam, to draw, after the distillation was finished, a current of air through the hot contents. Reasoning that the lower temperature would leave the metal in a more porous condition, I wanted to oxidize a portion of the copper, and, after treatment with acid, obtain a higher-grade bullion.

Although nothing further was done in the matter, I always thought well enough of my proposition to feel quite complimented when, last year, a distinguished metallurgist, Mr. C. A. Stetefeldt, of New York, took out a patent on the identical idea of distilling in vacuo, by attaching a steam jet to an amalgam retort. As far as any claims of my own were concerned, I wanted to let them rest, and hoped that Mr. Stetefeldt, when he introduced his patent at the Lexington mill, in Montana, last year, would make a success of it. I am informed that he did not; nor was I astonished when I obtained a sketch of his apparatus, which I consider faulty in principle. This circumstance tempts me to try to save a correct idea by publishing my own views how it ought to be put in practice.

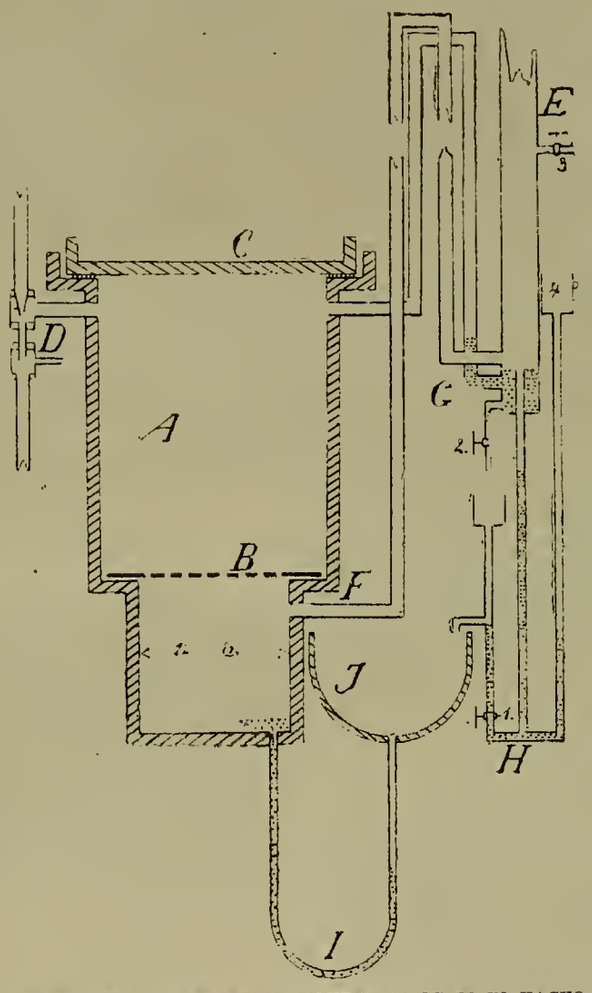
Mr. Stetefeldt blows his steam jet into the 3-inch pipe connecting with the retort, and carries the mixture of steam and quicksilver fumes through a closed sheet-iron box one foot wide, two feet high and four feet long, which is placed in a water trough. The condensing surface is increased by 72 horizontal 1½-inch tubes, secured like boiler tubes, and three vertical partitions force the gaseous current to a curved motion. Thus he obtains only a draft, but nothing approaching a vacuum, and the condensation of the mixture of steam and quicksilver fumes must be very ineffectual. Besides, the plant has an abundance of joints and chances for leakage—certainly out of place in a vessel which has to hold quicksilver and withstand the atmospheric pressure.

My own apparatus is represented by the figure in vertical section. It is somewhat similar to another constructed by me some years ago, for a different purpose, at a gold refinery in this city, which has been described in Percy's "Metallurgy, Gold and Silver," page 484.

A cast-iron tank, A, three feet high, two feet wide and as long as necessary to take in all the retorts of the establishment, is placed in the rear of the retorting furnace in right angle to the retorts. A set-off in the casting supports the sheet-iron, perforated false bottom, B, and a rim or shoulder, extending round the whole tank, carries the cast-iron cover, C. This cover, C, rests on strips of sheet-rubber which, when the air in A is exhausted, and the weight of the atmosphere, amounting to many tons, settles on the cover, is sufficiently compressed to form an absolutely tight packing. The vacuum is produced by the steam jet pump, D, according to well-known principles. The orifice of the jet is one-quarter of an inch and the steam blows, at the distance of one-half inch, into a half-inch pipe three inches long. From the latter the mixture of steam and air expands into a larger pipe, sucking up more or less air from a branch pipe, as shown in the figure, so that when the steam is shut off the vacuum in A is at once brought into communication with the atmosphere. Under a pressure of sixty pounds steam the vacuum corresponding to a column of eighteen inches quicksilver is readily obtained. A much higher vacuum can be produced by certain modifications which I will pass here, as I consider a vacuum of the stated tension quite sufficient for the purpose.

The tank, A, is filled with water to within one foot above the false bottom, the pipes for letting water in or out being omitted in the figure. The pipe, E, connects with the retort. The quicksilver vapor is led from the retort and condensed by a Liebig's cooler in the usual way, so that all the quicksilver thus condensed must flow into E. As long as the retort is not yet hot enough, the air escapes through G. When the quicksilver commences to run, stopcock 2 is shut, the condensed quicksilver closes G, steam is turned on, a vacuum produced above the water in A, and the air or vapor in the retort forced to travel through pipe, F, the false bottom and the water, before reaching their outlet. The water in A need hardly to be renewed during one operation, as it will not get very warm. By far the largest portion of the quicksilver is condensed by the Liebig cooler, and what passes into E is cooled already. Besides, the latent heat of quicksilver-vapor is very small, only about one tenth of that of water-vapor. If the Liebig cooler is made long enough, and constructed after correct principles, that is, in sections of gas-pipe with gradually reduced diameter, the water in the tank A may be altogether dispensed with. In any case, the condensing water in A, must not be allowed to run to waste before it has passed some other vessel where any suspended globules of quicksilver get a chance to settle. If the steam from the steam jet discharges into the same vessel, the settling will be greatly facilitated by the heat. Where the mill-site allows it, this settling vessel ought to be placed about twenty feet below A, otherwise a small Giffard injector must overcome the atmospheric pressure whilst the water discharges from A, during the distilling operation. Small as this inconvenience is, it is better altogether avoided as described above, by bestowing some attention to the construction of the Liebig cooler. The present style of sticking a three-inch pipe into another four inches wide and four feet long is not sufficient to dispense with the additional water condensation, as described, when the speed with which the vapor rushes into the vacuum is considered.

It remains to mention two difficulties: In the first place, there will be required an automatically acting, absolutely safe contrivance which prevents the water from rising into the retort if the vacuum should be suddenly destroyed by leakage or breakage before the workman can open aircock, 3. This is effected by the pipe G, which connects the air-space in A, with the quicksilver at the bottom of E. During regular working the quicksilver will rise in this pipe correspondingly to the hydraulic hindrances of the false bottom and the cooling water. When the vacuum in A is destroyed, the quicksilver in G will fall back and allow the air to enter E. In the second place, it is necessary that the workman can watch the flow of the condensed quicksilver at any time without using stop-cocks or peeping through glass tubes. This purpose is served by the combination of the pipes H and I, and the well, J, with the pipe, E, and the tank, A. The well, J, which also allows to ladle the quicksilver from A, when desirable to do so, receives the condensed quicksilver from E, and discharges it into A. If there is no vacuum in A, this is done by ordinary gravity; if a vacuum exists of, say eighteen inches of quicksilver, the quicksilver in H will stand eighteen inches above its outlet: the well, J, will run empty and the atmospheric pressure will balance a column of quicksilver standing eighteen inches high in the left branch of the pipe, I. It will be readily understood now how the flow of quicksilver into H, from E, will cause its discharge into the well, whilst the flow from the well into I will cause its lifting into A. The level of the quicksilver in the right-hand branch of I, during the distillation below its level in the well previous to the action of the steam jet, serves also as a vacuum-gauge to the workman. Under ordinary atmospheric pressure the weight of the water column in A will cause the rise of the quicksilver in the well by one inch, more or less, but no water can of course escape. By closing stop-cock 1, and ladling quicksilver into 4 until it stands in the funnel, the pipes F and G are converted into barometers, and that particular retort is disconnected from the vacuum.



APPARATUS FOR RETORTING SILVER AMALGAM IN VACUO.

The principal advantages of the described improvement are the prevention of loss of quicksilver and of danger of salivation by leaks in the retort door and the saving in time and fuel by the rapid removal of the quicksilver vapor. For no other substance subjected to evaporation or distillation is the rapid removal of its vapor so necessary as for quicksilver. To compare the distillation, as proposed, and the one now practiced with the evaporation in the vacuum pan of a sugar refinery and in a closed steam boiler, would still not be sufficient to cover the case. Quicksilver vapor has not, like steam, a tension rapidly increasing with a slight rise of temperature, but requires a considerably higher heat over its boiling point before it will escape with energy from a closed vessel. Even then, owing to its high specific gravity, it will move very much slower than air or steam. The well known formula—

$$\text{velocity} = \sqrt{2g \frac{p^1 - p}{s}}$$

in which $p^1 - p$ represents the difference between inner and outer pressure, $2g = 64.4$ = the acceleration of gravity, and s the specific gravity of the gaseous or liquid substance, the specific gravity of the vapors of water and quicksilver at their boiling point being = 0.62 : 6.97 = 1 : 11, proves that under equal pressure steam will escape $\sqrt{11} = 3.3$ times quicker.

The necessity of the speedy removal of the quicksilver vapor from an amalgam retort is also proven every day, when the retorted amalgam is removed. The silver is found half, often quite molten, where it touched the iron, showing the high heat employed, whilst metallic quicksilver may be nearly always discovered in the less strongly heated portion. A superficial observer might take that readily as a proof that the heat was not high enough or the time not sufficient, and forget that quicksilver will as little evaporate in an atmosphere saturated with its vapor as any other liquid will.

In conclusion, I hope that if these points seem of sufficient weight to induce the change in the distillation of quicksilver which I have suggested, it will serve to draw attention to the advantages which the distillation in vacuo offers also for other substances—coal oil for instance. This is a field very little examined into, in which research would certainly be interesting, and possibly valuable.

A Cable Railroad Edition.

We shall, in a short time, issue a large 40 page edition of the MINING AND SCIENTIFIC PRESS devoted to the cable railway system so extensively in use in this city.

This number will contain detailed descriptions of the roads now in operation—the Market, Haight and McAllister St., Presidio, Clay, Geary, Sutter and California Sts., and Telegraph Hill lines. The details of construction and operation will all be considered, and all the desirable information concerning the subject will be gathered. This edition will be very fully illustrated with plans, drawings, etc. All the new improvements in the running of the cable roads will be given. In addition we shall have articles embodying the engineering features of the road. There will also be descriptions of the new and improved appliances of recent invention adapted for use on these roads.

We shall print a very large edition of the number of the PRESS referred to, as the subject is one of such great interest to so many persons. The cable system for the propulsion of street cars is rapidly being introduced into other cities in this country, Europe and Australia. But as it had its inception in San Francisco and is most largely used here, carefully illustrated descriptions of our local roads will be useful to engineers and the public everywhere. Those interested in cable roads, and desiring extra copies of the double number of the PRESS, should send in their orders without delay.

IT is reported that the Mount Diablo Company, at Candelaria, will shortly erect a 20-stamp mill at Sodaville, on the Carson and Colorado Railroad.

THE mines at Bernice, Nevada, are said to be constantly improving. Of late a rich strike has been made there. About 60 men are employed at the mill and mines.

Lost Ledges.

The Mythology of the Desert.

The time will come, says a correspondant of the Calico *Print*, when anything pertaining to the past history of mines upon the desert, or more properly speaking, on the frontiers of California and Nevada, will be read with interest. Then, if the historian follows his text closely, will be found a portion given to the above subject.

It is the writer's object to now place on record the various stories that he has heard during the past 25 years, regarding the various mines or ledges that have been frequently hunted for, and of which there seems to be no certainty that they will ever be found. No doubt there are many old stories afloat that the writer has never heard repeated, but such as he has he will place before the reader and will here also say to the future historians that he can vouch for but little conveyed therein, as it nearly all comes from hearsay, hence the to caption to this article.

The first story of this nature we remember hearing was given us by an old Mexican at Los Angeles in 1861. He said that when he was quite young and then living with the Fathers at the Mission San Fernando, situated a short distance to the northward from Los Angeles, a Mexican would start out in the spring with two mules loaded with provisions sufficient for all summer's supply; that he would take no companions with him, and travel northward towards Elizabeth Lake and return in the fall after an absence of about six months, with his mules laden with silver bullion. This he did for three seasons, but on the fourth he went out as usual but never returned.

The time when this occurred, if occur it did, must have been as far back as 1810, or previous. This old story has recurred to the writer quite forcibly since the discovery of the Calico mines with rich horn-silver croppings as well as a cave or tunnel-like excavation that has since been found on one of the mines. It is possible that this old-time explorer of the desert, wandering northward from San Fernando, came through the natural pass of the mountains, at Elizabeth Lake, thence traveling eastward along the base of the Sierra Madras at last came to the Mojave river, and following down the stream ended his explorations by searching the Calico hills for mineral, and finding the metal in an almost pure state it would require but little skill to reduce it to bullion with any sort of a rude furnace.

So much for that old myth or tradition; of the others to follow, they are all American and of far more recent date.

The Gunsight.

It would be impossible to place before the reader all the different stories the writer has heard regarding the old Gunsight mine, said to have been found by the emigrants of '49, conflicting as many of them do with each other. However, there are two stories that have some semblance of truth and which would seem to locate two separate and distinct finds that year, one of them a gold mine of float rock found in the vicinity of the south end of Death Valley, or what is now near the dividing line between Inyo and San Bernardino counties, and the other a silver mine or float rock, found in the northern portion of the same valley, some 50 miles north of Telescope Peak, the highest point of the Panamint range. For convenience we will designate these as the Silver Gunsight and the Gold Gunsight, and taking up the former, repeat the most plausible story regarding it that we have heard.

Rhodes Party of Emigrants.

During the latter part of August, 1849, a party of emigrants under the leadership of a Mr. Rhodes, coming direct across the plains, entered Death Valley from the east through a natural pass known as Furniss creek, named since that time after a man by that name. Here the emigrants turned northward along the east side of the valley and made their camp at what is now known as Poison Springs. Here a large number were taken sick and 22 died. The emigrants thinking that it was the poisonous nature of the water that had made them sick, made haste to get away. Abandoning their wagons and a greater part of their goods, some on foot, some astride of oxen and some on horseback they made their way westward across the valley, the horsemen riding forward in search of water.

It was while upon this search that a piece of float rock with pure metalic silver was picked up by one of the horsemen, and it is now in the possession of an old lady, one of those emigrants, now residing at Oroville, Cal. In the spring of 1875, a gentleman living in Panamint, who had heard the story of the finding of this piece of ore, induced a young man by the name of Nesbit, who was with the party that found the specimen, to come and assist him in a search for the mine or at least the place where the ore was found.

They went to Furniss creek and thence followed the route that had been passed over so many years before. Arriving at a point some 15 miles northeast of Emigrant Springs and eastward from Town's pass some 20 miles, Nesbit recognized it as being the place where the silver float was found. It was a deep wash that put down into Death valley from Emigrant Springs, and as there is a silver-bearing, black metal ledge crossing the canon at those springs, they thought it possible that the float had come off the outer croppings of this ledge and had drifted down the wash to the place where it was found. As there were no indications of another mine in that section they gave up the search. Many others previous to that, and several since, have hunted for the Silver Gunsight mine but that was evidently the nearest approach ever made towards its discovery.

Paved With Gold and Silver.

Our principal streets are receiving a top-dressing of rock from the waste dumps to put them in order for the coming winter. Very frequently during the summer pieces of good ore have been picked out from among that dumped in the roadway by the carts, but recently it was evident that a new waste dump had been attacked, as there was an unusual preponderance of ore in the material. It seemed, in fact, to be nearly all ore. Close examination, however, showed that a considerable amount of what at the first glance seemed good ore was very base, yet with this base was mingled much rich black sulphuret ore.

From a lot of this dumped on C street, in front of Odd Fellows' Hall, we took two samples which were crushed up together and assayed by J. R. Ryan, of the Consolidated Virginia assay office, with the following result: Gold, $164.75; silver, $168; total, $332.75.

This is pretty good "waste rock" with which to fill in the streets! We induced a millman of Silver City to examine the rock that was being dumped from the street carts. At first he thought it all base, but on looking more carefully he began to find lumps of genuine black sulphuret ore, and finally said: "This is better material than most of that now being taken out on the old upper levels. It would pay well for working."

The assay given above was made after this, and the opinion obtained from the millman was founded wholly on what he saw before him. It is said that the rock of which we are speaking is obtained at a waste dump up near the corner of A and Carson streets. The rock was probably brought out of the old Burning Moscow in the early days. Miners were not then good judges of ore. Some portions of the vein having been assayed and found to be base, it was probably concluded that all was base, as only a practiced eye would note the difference of grain.

Wherever the rock may have been mined, it is evident that it would pay pretty well to overhaul that waste dump. By careful assorting, no doubt a large amount of good ore might easily be obtained.—*Virginia Enterprise.*

NEW ORE HOUSES AT THE ANACONDA MINE.—The Anaconda company is putting up a large and very substantial ore house to enable them more conveniently to ship their ore. The ore is to be run in cars from this shaft to the chutes and there dumped. The ore will then run down into this house and by means of movable chutes will be loaded in bulk upon the cars. It will enable the company to handle if necessary a thousand tons a day. Through the courtesy of Mr. D. A. Gilchrist, the mechanic superintending the construction of the house, we were enabled to get a good idea of the work. The house, is just above the railroad switch. It is put up on timbers fourteen inches square, all bolted together in the most substantial manner. The upper story is a slanting floor, five inches thick, and overlaid with sheet-iron. The floor rests on timbers 12x14 inches in size. Here the ore is to be stored until shipped on the cars. The house is 134 feet loug and has twelve chutes. At the St. Lawrence another house, the duplicate of this, is to be put up. Besides these houses there are other houses where the high grade ore that is to be sacked and shipped to the East, is stored for shipment. All these houses are of the most substantial kind, and if one may judge from the appearance of the buildings the owners of the mine have as much confidence in the mine as have the outsiders.—*Butte Miner.*

A BIG TEAMING PROPOSITION.—George W. Ponter, the leading contract teamster of the southern country, went down the C. & C. road yesterday to figure on proposals for hauling the Mammoth mill to Aurora. A rough estimate of the cost has been made at $12,000, but as some competition has sprung up, the figures have been changed somewhat. The mill was built at Mammoth City, 35 miles south of Bodie, at the time of the mining excitement in that district, when George D. Roberts, George M. Pinney and other speculators manufactured a boom in Mammoth stock and unloaded at a good figure. The mill has 40 stamps and cost $150,000.—*Virginia Chronicle.*

THE PYRAMID FURNACE A SUCCESS.—The Reno *Gazette* of evening before last says: The furnace at Pyramid began running Tuesday and has since been smelting at the rate of ten tons per day, and will run about 5,000 pounds of copper matte containing considerable gold and silver. The copper is worth about 12½ cents per pound. Pierce Evans, the secretary, estimates the value of gold, silver and copper at $600 a day. The ore is worked at a cost of $10 a ton. This is good news indeed, and everybody hopes that the men who have stayed with it so long may realize handsomely from it. Two new furnaces will be put up at once.

New Channels for Raw Copper.

The present low price of raw copper may well be worth all it will cost producers if it serve to direct thoughtful attention to the necessity of looking up new channels for the employment of that metal. An avenue that suggests itself in connection with the annual consumption of a considerable amount of raw copper, is the one leading in the direction of sheathing for roofing purposes. Concerning this, the Michigan *Mining Gazette* has the following: No person erecting a building of any value, whether intended for a residence or place of business, if his attention is properly called to the matter, would hesitate to cover it with the best roofing material, provided the cost would not be too great. That copper sheathing excels all other roofing substances in economy, when its duration and absence of expense for keeping it in repair and value for old metal when it has served its purpose, are considered, admits of no doubt. Buildings can be found in this country, the roofs of which were covered with copper over one hundred years ago, that are in as good condition to-day as when first put down. After copper sheathing is once in place, it requires no repairing or safety covering like slate, tin, iron or shingles, while no reasonable limit can be placed to its lastingness. In Europe copper roofs can be found that were put on over five hundred years ago!

It is not our purpose to amplify this subject; our aim is simply to call attention to the matter for the purpose of invoking a practical discussion of the topic, which, if intelligently carried on, must in time result in the introduction of copper sheathing for roofing purposes.

As an aid in this direction, we give below a table showing the cost, per 100 square feet, for covering a building with copper sheathing, with sheets running from 10 ounces to the square foot up to 16 ounces to the square foot, on a basis of raw copper at 14 cents a pound, and allowing three cents a pound for rolling it; also, a table exhibiting the thickness of the different weight sheets:

Ingot copper	14 cents	
Cost of manufacturing	3 "	17 cents
100 superficial feet 10-ounce copper, 62½ lbs., cost		$10 62
" " " 12 " " 75 "		12 75
" " " 14 " " 87½ "		14 87
" " " 16 " " 100 "		17 00

THICKNESS OF COPPER.

10-ounce copper, 73 6-10 of an inch thick	28	wire gauge
12 " " 01 4 12 " " "	27	"
14 " " 52 8-14 " " "	26	"
16 " " 46 " " "	25	"

Another channel which we think can be made serviceable in the consumption of raw copper is the manufacture of stove-pipe out of cold-rolled copper sheathing. To help those whose interest it is to look up and debate the question of the employment of copper in this direction, we give underneath a table showing the comparative cost of different sizes of stove-pipe, based on retail prices in this section, with that of copper sheathing stove-pipe of various weights and sizes, on a basis of raw copper at 14 cents a pound, and allowing 3 cents a pound for hot-rolling sheets and 1 cent a pound for cold-rolliug them. In connection with copper stove-pipe, the fact must not be lost sight of, that, like copper roofing, after it has served its purpose, the worn out lengths are worth so much for old metal:

Costs of Russian iron stove-pipes—

8-inch stove-pipe,	24-inch length			60 cents
7 " "	24 " "			50 "
6 " "	24 " "			40 "

Cost of common iron stove-pipes—

8-inch stove-pipe,	24-inch length			37 cents
7 " "	24 " "			30 "
6 " "	24 " "			25 "

Cost of 10-ounce copper stove-pipes, cold-rolled—

8-inch stove-pipe,	24-inch length			48 cents
7 " "	24 " "			42 "
6 " "	24 " "			36 "

Cost of 12-ounce copper stove pipes, cold-rolled—

8-inch stove-pipe,	24-inch length			58 cents
7 " "	24 " "			52 "
6 " "	24 " "			45 "

Cost of 14-ounce copper stove-pipes, cold-rolled—

8-inch stove-pipe,	24-inch length			66 cents
7 " "	24 " "			57 "
6 " "	24 " "			53 "

Cost of 16-ounce copper stove-pipes, cold-rolled—

8-inch stove-pipe,	24-inch length			74 cents
7 " "	24 " "			66 "
6 " "	24 " "			58 "

On a basis of ingot at	14 cents
Hot-rolling	3 "
Cold "	1 "
Total	18 "

A MISTAKE.—A Smartsville dispatch of Monday says: "The war of persecution waged by the Marysville people against the men who have been engaged in cleaning the bedrock, still continues. Sheriff McCoy arrived to-day with a number of warrants for arrests, charging the parties with an alleged contempt of court on August 8th. Hydraulic mining ceased here a year ago, which fact is known to the leading men of Marysville, who are also aware that the largest mines above this place are being run to their fullest capacity, and no efforts are being made to shut them down." It is a mistake that the "largest mines" above Smartsville are operating. So far as Nevada county is concerned, none of them have been piping for some time. A little cleaning of bedrock has been going on in places, but then that is none of the anti-miners' business.—*Nevada Transcript.*

The Yankee Fork Mines.

A late trip to the Yankee Fork country has confirmed, more than ever, the opinion that its mining resources are great when fully developed. The last work done on the Summit, Unknown and Custer show those three to be one lode and that further their strike is in the direction of the Norton Hill, where is the famed Charles Dickens, Juliet, Daniel O'Connel, Pilot Group and others. And still continuing on to the west are, it would seem, infallible signs of great ore wealth. On Jordon creek, which adjoins the Pilot Group, on the creek bottom is a fine field of placers, which have been worked for years by the owner, Mr. J. G. Morrison, with excellent success, producing many thousands of dollars of dust per year. In working it this year, on a high point on the west bank of Jordon creek, Mr. Morrison has taken very good pay for the season, but the indication of good rock is more strongly marked by the coarse gold found there, perhaps, than in any other way. Mr. Morrison showed his friends at Bouanza on the occasion of our visit, a large number of coarse gold pieces, but more particularly a set of beauties—one weighing an ounce, one about three ounces, and another of six ounces in weight, all of which are gems without rock. They are smooth, but the hight at which they were taken indicates a nearness to the place of their birth, and Mr. Morrison from this and other signs that surround the whole premises, is full in the faith that in the ledges on the west side of the Jordon will be found a chimney or two (perhaps more) of immense wealth. We see nothing unreasonable in his theory, but rather everything to show that he is correct, and we look for future developments to prove its correctness. There is no mistaking the fact that the Charles Dickens connects through the Pilot Group, and there can be no reasonable doubt but that the Washington, owned by Mr. Morrison, is a strong vein which connects with the Pilot Group on the west, the same as the Dickens does on the east. Mr. Morrison owns a number of quartz claims on this west side of Jordon, but the Washington is most closely allied to the more noted claims on the through lead. On the west were found those coarse lumps, mostly in close proximity to excellent looking rock of the vein. Assays of different points and at different times speak well for the west side lodes. Work has not been pushed to any great extent on these claims, although on the Paradise there is a tunnel run of three or four hundred feet. The mine lies on the south side of Morrison creek, which puts into Jordon from the west, and this tunnel is run in on the north side of the claim to tap the vein, and then it runs on the lode; the greater portion of its line is to cut the vein, but there has been considerable ore taken from this lead through it. Some surface work on the line of the lode also shows well for ore and directness as well as continuity of the lead. Assays would tell little as to the wealth of these claims, as the rock would run from a small sum to fabulous figures, some being pure gold or nearly so.

The main rock where pay appears to exist is black sulphuret, and, from our examination, we should judge its reduction will require about the same style of machinery that the Custer mine does with, perhaps, this exception, that, as you go west you may find a little more copper. And as you go deeper the show of it is greater. That this is one very large belt of porphyry with different stratas of valuable ore bearing a heavy per cent of gold on top, with silver predominating as you go down on them, and bearing a per cent of copper as you attain greater depth there is little doubt. We by no means could think after all our examinations that the Custer, Charles Dickens and Unknown are all the good lodes that are to be opened on this great belt. And it will not be surprising to have it prove on full development that the richest chutes in the whole range are still further west than the thread of Jordon creek. No coarse gold in the placer grounds reaches above the Washington quartz claim and the body of placer gold has been found on the west of Jordon and below the different quartz ledges—the Washington lies highest up the creek of all leads in the west side cluster. Mr. Morrison says that there has been some new discoveries made still higher on the mountain to the west of all former ones this summer. In our judgment the mines of this region are just tapped on the edge and we sincerely hope and believe ours, this time, is a sound judgment. It is hardly possible that this placer deposited at the mouth of Jordon creek is all that there was in the mountain rock, and it being so peculiarly connected with these veins, which show well, it may be considered that the rock and placer wealth have originally been one and that there is yet awaiting this particular region a great future.—*Idaho Messenger.*

MOLYBDENUM.—Molybdenum, as the mineral molybdenite (sulphide), occurs crystallized in veins about 4 miles north of Pitkin and near Rock creek, Gunnison county, Colorado. The quantity is probably sufficient to render these veins valuable in the future. As molybdate of lead, it is said to occur in Leadville in small quantity, and to be very abundant in Utah. Molybdenite occurs at Blue Hill bay, Maine, and at Westmoreland, New Hampshire. Many other localities have been reported. Salts of molybdenum are used to a certain extent in chemical operations, but the supply is quite limited.

Iridium.

In a paper "On the Application of Iridium to Art and Manufacture," read before the American Institute of Mining Engineers, Mr. Dudley stated that the prineipal sources of supply are Russia and Californuia, the iridium in the former country heing obtained from the platinum mines of the Urals, and in California from the placer gold washings, where, indeed, it is a source of considerable annoyance on account of its specific gravity, whieh is about 19.3, nearly the same as that of gold. Consequently it is impossible to separate the gold from the iridium by the process of washing, and it has to be effected, therefore, hy amalgamation of the gold, or dissolving it out in aqua regia. The possession of or dealing with iridium in any way is forbidden by law in Russia, on account of speculators in gold dust adding iridium to it to increase its weight, the result being that when the gold came to be worked in the mint and the ingots to be rolled into sheets, the individual grains or particles of iridium produced indentations in the rolls, and in striking out the coins the dies were marked and defaced, causing considerable loss to the Government. Notwithstanding its comparative abundance, up to the present time iridium has only been applied (with the exception of alloying with platinm) for pointing gold pens, forming what is called "diamond" point, and being, in reality, a small grain of iridosmine (or alloy with osmium) soldered on to the tip of the pen. Hypodermic needles for surgical use are now made of gold and tipped with iridium, which is not subject to corrosion, like the old steel points, and it is being largely applied to the instruments for surveyors and engineers. In all these cases the combination with the phosphorus by fusion has been the moving power. The application of iridium is now being made to electrical purposes; but the phosphorus in the experiments has to be removed, as being an obstacle to success. This being done, the iridium is available for electrical contact points of telegraphic apparatus, and they are found to be far superior to platinum, the iridium outliving the platinum, and not being subject to oxidation or sticking, as are the latter points, all that is necessary to clean the iridium being to pass emery paper over the surface. Mr. Dudley is now engaged in experiments for plating with iridium, and has succeeded in obtaining a bright reguline deposit of iridium of base metals, which deposit resembles the natural metal, heing quite hard and resisting the action of acids.

Niter.

Niter (saltpeter) is found native in many of the Western and Southwestern States, and in the Territories of the far West. During the war some native niter was utilized, but its quality was poor, and it is said that loss would be incurred in refining it here now.

Saltpeter yards or "plantations" were worked on the eastern sea-board in the early history of this country; and it is noteworthy that at that time the principle of germ fermentation (by mother-of-peter or seedpeter) was well understood, for in preparing a new yard it was customary to "salt" it with the earth from an old yard, the effect, if not the reason, being clearly appreciated.

At present the greater part of the saltpeter used in this country is converted from Peruviaa sodium nitrate and German potassium chloride, the two by interchange forming a pure potassium nitrate or saltpeter. This process is a comparatively new one, having been used only during the past twenty years. As the supply of sodium nitrate and potassium chloride is almost unlimited, and the artificial saltpeter made from them is so superior in quality, being nearly chemically pure, it is preferred to the natural article, and has, to a large extent, supplanted the latter.

Rich deposits exist in India, from which nearly all the crude substanee is imported, some of it (refined) coming by way of England.

Copperas.—The estimated production of copperas (sulpbate of iron) in this country during the year 1882 was 15,000,000 pounds, having an average spot value of three-quarters of a cent per pound. This material is largely made from the waste oil of vitriol from wire and galvanizing works, with scrap iron. It is also made from alum shale. The principal centers of productiou are as follows: Worcester, Massachusetts; New Haven, Connecticut; Buffalo, New York; Philadelphia and Johnstown, Pennsylvania; Cleveland and Steubenville, Ohio; and St. Louis, Missouri. Its principal uses are in paper and print mills, bleacheries, dyeing establishments, chemical manufacturing establishments, paint and ink manufactories, and for sanitary purposes as a disinfectant.

Economical Working.—At the head of the winze ou the 200 level of the Hale and Norcross, is a donkey hoisting engine that is driven by steam carried through a pipe 1,000 feet in length. The steam is generated in a boiler at the old works, and it is found that it reaches the engine with a loss of but five pounds in pressure. This is much cheaper than would be compressed air. The winze is down 85 feet, and the engine does the work of hoisting most satisfactorily.—*Virginia Enterprise.*

Useful Information.

Facts Worth Knowing Around the Laundry.

That by adding two parts of cream of tartar to one part of oxalic acid, ground fine and kept dry, in a bottle, you will find, by applying a little of the powder to rust stains while the article is wet, that the result is much quicker and better. Wash out in clear warm water to prevent injury to the goods.

That cold rain water and soap will take out machine grease, where other means would not be advisable on account of colors running, etc.

That turpentine in small quantities may be used in boiling white goods to a great advantage, as it improves the color, and the boiling drives off all odor. Resia in soap is quite another thing; it injures and discolors some goods, and shrinks woolens. Soap men argue that on account of the turpentine in the resin it assists in the washing. It is used for a filler and to make the soap hard and cheap. It is a fraud on the consumer.

That kerosene will soften leather belts or boots that have become hard from exposure or use around the wash room. Good for the harness when hard from rain or dampness. Wash with warm water, then grease with good animal oil or dressing like the following.

That the government harness dressing is as follows: One gallon of neatsfoot oil, two pounds of Bayberry tallow, two pounds of beeswax, two pounds of beef tallow. Put the above in a pan over a moderate fire. When thoroughly dissolved add two quarts of castor oil then while on the fire stir in one ounce of lampblack. Mix well and strain through a fine cloth to remove sediment, let cool, and you have as fine a dressing for harness or leather of any kind as can be had.

That baking soda gives instant relief to a burn or scald. Applied either dry or wet to the burned part *immediately*, the sense of relief is magical. It seems to withdraw the heat and with it the pain. Keep it in the ironing-room.

That Javelle water, often met with in works or articles on cleaning and dyeing, is made of one gallon of water and four pounds of ordinary washing soda. Boil for five or ten minutes, then add one pound of chloride of lime. Let cool, and keep corked in a jug or tight vessel.

That when acid has been dropped on any article of clothing, liquid ammonia will kill the acid, and then by applying chloroform you will restore the color in most cases.

That "cyanide of potassium" will remove all indelible inks whose base is nitrate of silver. Being a deadly poison, it will be hard to get from the druggest in most cities. Turpentine or alcohnl rubbed in hot, removes the new inks, using soda and soap freely in hot water afterward.—*National Laundry Journal.*

Utilizing Coal Dust.

The French manufacturers of "patent fuel," or bricks of coal, particularly in the Nantes district, import a large quantity of coal dust from Cardiff, Swansea and Newport. The process of manufacture is very simple. The coal dust is mixed with pitch and the mixture poured into cups attached to a belt, each cup containing just enough material for a brick of the size desired. The belt in its movement passes this material through a chamber where it is exposed to steam, which fuses the two substances into a homogeneous mass. This is poured by the descent of the belt into molds, where it is subjected to an enormous pressure by a hydraulic press or by machinery set in motion by a steam engine. The brick is square in form, its thickness being about one-third of its other dimensions, and its weight 5, 10 or 15 pounds. Certain of the French railway companies refuse to accept fuel unless at least 10 per cent of pitch has been used for its agglomeration. It is stated that briquettes are preferable to ordinary coal for exportation to the colonies and to warm climates on account of their compact storage and freedom from small fragments and dust, also for use on locomotives both on account of economy of space and because firemen can always determine the amount of fuel they are employing in a given time, the weight of each brick being exactly known. The manufacturers claim that the patent fuel is more healthy for domestic use than ordinary coal, citing in support of this thoery the declaration of certain well-known physicians. At the present day a large number of bricks are made for domestic use, of small size, and perforated with circular or longitudinal openings.

Glue, Paste or Mucilage.—Lehner publishes in a German periodical the following formula for making a liquid paste or glue from starch and acid. Place five pounds of potato starch in six pounds of water, and add one-quarter pound of pure nitric acid. Keep it in a warm place, stirring frequently for 48 hours. Then boil the mixture until it forms a thick and translucent substance. Dilute with water, if necessary, and filter through a thick cloth. At the same time another paste is made from sugar and gum arabic. Dissolve five pounds gum arabic and one pound of sugar in five pounds of water, and add one ounce of nitric acid and heat to boiling. Then mix the above with the starch paste. The resultant paste is liquid, does not mould, and dries on paper with a gloss. It is useful for labels, wrappers, and fine bookbinders' use. Dry pocket glue is made from 12 parts of glue and 5 parts of sugar. The glue is boiled until entirely dissolved, the sugar dissolved in the hot glue, and the mass evaporated until it hardens on cooling. The hard substance dissolves rapidly in luke warm water, and is an excellent glue for use on paper.

Removing Stains.—A mixture which is excellent for removing grease spots and stains from carpets and clothing is made of two ounces of ammonia, two ounces of white castile soap, one ounce of glycerine, one ounce of ether; cut the soap fine, dissolve in one pint of water over the fire; add two quarts of water. This should be mixed with water in the proportion of a teacupful to one ordinary-sized pail of water. Mix thoroughly, and wash soiled garments in it. For removing spots use a sponge or clean flannel cloth, and with a dry cloth rub as dry as possible. Woolen goods may be made to look bright and fresh by being sponged with this.

Silver for Photographic Purposes.—Some one who has been studying the subject intimates that not less than 40 tons of silver and 3 tons of gold are used in these United States every year in photographic processes. Making this estimate the basis of an additional calculation, by taking the amount of gold and silver required to produce a single cabinet picture, ascertaining the number of pictures that can be made with the amount of these metals as above given, and considering the average price charged for these pictures, it is found that more than $27,000,000 is expended in this country annually for photographic pictures.

Damp Walls.—To keep dampness from the inside rough walls of basement rooms, etc., rake out all the joints and clean the wall thoroughly; then plaster it carefully half an inch thick with a mortar made of Portland cement one part, sand one part. To be applied in a dry time, when no water is coming through the wall. The mortar is held up by the wall, and any considerable thickness of mortar tends to drag itself off by its own weight. The more the mortar is worked into the joints, the better. The cellar bottom may be covered with the same material, but should be two inches thick.

An Air-Brush.—Among the useful and interesting inventions exhibited at the recent photographers' convention at Philadelphia was one called the air-brush. A little holder is charged with India-ink, and by a bellows operated with a foot pedal, after the manner of a sewing-machine, the fluid is blown upon a faintly outlined portrait, the result giving a picture superior in many respects to the best crayon drawing. A life-size portrait may thus be made in a few hours, whereas formerly, by the use of the stump and pencil, as many weeks were required.

Good Health.

Health and the Electric Light.

The good or evil influence of the artificial light we use upon the health is of the very highest importance, although hitherto it has been to a great extent overlooked. Ancient custom has so familiarized us with combustion as a source of light that, until recent years, we hardly dreamed there could be any other. Nevertheless the introduction of the electric light has been opening our minds of late to the advantages of a purer kind of illuminatiou. Pure air is what we all seek when we go to the seaside or mountain top during our holidays. How important then is it that we should have pure air in our homes. The necessity which obliges us to live in towns, also obliges us to live in a more or less vitiated atmosphere. The mere fact of so many living beings crowded together is of itself sufficient to deteriorate the air. Assuredly it is not desirable that the very light we use should also vitiate the atmosphere.

Pure air and light are essential to good health, but in close, ill-ventilated city offices, and in thousands of homes and workshops, what prospect is there of a pure air while the lights, which are often burned half the day, are of themselves polluting it? For not only does a candle, oil, or gas flame waste the oxygen of the air, and thus rob it of its life-supporting virtue, but it actually soils it with noxious vapor, the products of combustion. These are chiefly water or steam and carbonic acid; but carbon dust, or soot, is also thrown off, and in the case of gas, sulphurous acid. Gas and other lights produced by combustion not only rob the air of its health-giving oxygen; they adulterate what remains of it. Carbonic acid gas, which is supplied to the atmosphere from a flame, is an active poison, fatal to animal life. It is the "choke-damp" of the miner; and though always present in minute quantities in the atmosphere, it becomes dangerous when in excess. On the score of health alone the introduction of electric light ought to be hastened as much as possible, nor should it be only the luxury of the rich, as a famous electrician, recently deceased, proclaimed it, but the necessity of the poor. Where purity and brightness are most needed, there purity and brightness should first come.

The effects of the electric light in the present electrical exhibition at Philadelphia are closely watched in this respect, and it has been observed that on the hottest evenings they have neither vitiated the atmosphere nor sensibly heated it, whereas, were these hundreds of lights, now aglow, given off by gas, it is safe to say that the atmosphere of the great hall would be intolerable.

A New and Singular Disease.—Among the curious maladies which advancing civilization seems destined to bring in its train, and one on which the physicians of Paris are just now bestowing much attention, is a kind of obliquity of mind, which is there called *peur de espaces*. The sufferer is usually a person in apparently good health, and the first symptoms of the new disease a feeling of weakness and sickness, which generally comes on very suddenly, when the person comes at some particular place or is brought into the presence of some particular person. He is then observed to be in mortal terror without any apparent cause. The earth seems to open into a chasm before his feet, or he finds himself isolated by an immense and impenetrable space from the rest of the world. If he is on the pavement, he does not step into the roadway. If he is on a step, he is afraid to move up or down for fear of being dashed to pieces in some imaginary abyss. All this time he keeps his reason in everything except this specialty, and is sensible of his absurd position and action, but is incapable of controlling himself. Men are oftener attacked than women, and most of the sufferers belong to the liberal professions, or move in the higher ranks of society.

Sleep for Children.—A correspondent inquires: "Ought young children, who are growing fast, and do not seem strong, to be allowed to sleep in the morning until they awaken? or should they be called at an early hour?" Ans. We do not believe in the special virtues of early rising. The time to get up is when the body is rested by sufficient sleep. Children need much more sleep than adults. It is chiefly during sleep that the processes of repair and growth are carried on. A child that has insufficient sleep cannot develop properly. Children should be taught to retire to bed early, and then they may be induced to get up early in the morning without harm; but if for any reason they are kept up late at night, they should be allowed to sleep in the morning until rested. Care must be taken however, to see that the time spent in bed in the morning is devoted to sound sleep. Dozing or lying in bed awake, should not be allowed in children at any age after they are old enough to understand instruction.

Tired Eyes.—People speak about their eyes being fatigued, meaning that the retina, or seeing portion of the brain is fatigued, but such is not the case, as the retina hardly ever gets tired. The fatigue is in the inner and outer muscles attached to the eyeball and the muscle of accommodation, which surrounds the lens of the eye. When a near object is to be looked at, the muscle relaxes and allows the lens to thicken, increasing its refractive power. The inner and outer muscle to which I referred are used in covering the eye on the object to be looked at, the inner one being especially used when a near object is to be looked at. It is in the three muscles mentioned that the fatigue is felt, and relief is secured temporarily by closing the eyes or gazing at far-distant objects. The usual indication of strain is a redness of the rim of the eyelid, betokening a congested state of the inner surface, accompanied with some pain. Rest is not the proper remedy for a fatigued eye, but the use of glasses of sufficient power to render unnecessary so much effort to accommodate the eye to vision.

Stuttering.—The *Scientific American*, in answer to a query in regard to stuttering by a twenty-month-old child, says: "No medicines will be of any service, but you should have the child examined by some good physician. Stuttering in children is often caused by something abnormal in the mouth or throat; cleft palate, for instance, elongated or diseased uvula, a tumor at some point, etc. It is also caused by hearing some one else stutter; the remedy for this is of course to keep them away from the influence. If neither of these causes exist, you must wait; nothing can be really done to break the habit before the child is six or seven years old."

Eucalyptus in Whooping Cough.—The editor of the *N. E Medical Monthly* having seen eucalyptus globules administered for whooping cough, gave it a trial in his practice in some 25 or 30 cases, with great success. Its effect was to greatly modify the paroxysms in every case, and often so abated the symptoms that the cough would be of trifling violence. These results would seem to merit a trial by other practicioners, as a very simple remedy and one from which no harm can come as an experiment. The manner and strength of the dose is not given.

Decay of the Bones.—This is a terrible disease—the shrinking and ultimate decay of the bones of the human system. It is usually, if not always, a result of insufficient or improper nourishment during childhood. It is a disease which, when it has once attacked the system, cannot be eradicated by any diet or medicine that may subsequently be taken. Unfamiliar as this disease is, it is so common in London and some other portions of England that the frequent cases exposed at the clinics attract no special attention. It is almost unknown in America.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SUTTER CREEK.—Cor. Amador *Ledger*, Oct. 2: The controversy over water between the Lincoln and Mahoney managements continues, notwithstanding the decision of the court last week modifying the injunction so as to enable the Mahoney to use surplus water nine hours out of every twenty-four. The Mahoney people are not satisfied with the arrangement, as they claim that after a test the amount of water is inadequate.

Inyo.

RICH ORE.—Inyo *Independent*, Oct. 4: A few men at work at the Kearsarge mine are taking out some rich ore. Twenty sacks brought down to the little mill last Wednesday were filled with ore worth 50 cents per pound. Samples of this ore assayed in San Francisco contained $1,250 per ton. A run of ore, made at the mill some days ago, yielded very large returns.

Mariposa.

PROSPECTING.—Mariposa *Gazette*, Oct. 3: The firm of H. Ward & Co., of which Capt. H. H. Todd of Alameda is a member, are prospecting mines in the vicinity of Ferguson's Mountain View Hotel, of which hotel Jimmy Ferguson is the proprietor. Capt. Todd was in town on Thursday and called to see us. The company are expending considerable labor and money in search of something permanent to justify a greater outlay in mining. They have sunk shafts and run several hundred ft of tunnels and cross-cuts, and have cut and uncovered several veins of quartz, some of which have shown just enough of the precious metal to incite suspicion that there must be a rich pocket just a little farther along, and of course they went for it, and are in search of it yet. While they have been prospecting ores from several localities, they have piled up some 50 to 60 tons which is estimated by the men, who have had the handling of it, to be worth $60 a ton. But the Captain thinks it will, no doubt, pay $15 a ton, and it might yield $20. What the company want in order to be satisfied for their labor and money expended is to find a vein of gold-bearing quartz of sufficient extent, that will yield $8 a ton, and then they will build a mill and create a property that will be a permanent institution. There is quite a large district of mines extending from Ferguson's to and including Bear creek and the mines on Sweetwater. At the latter place there is already considerable mining being done by the Grove's and Ferguson Companies, which enterprises, as yet, are comparatively new.

Nevada.

MORE GOOD ORE.—*Tidings*, Oct. 4: For several days past the rock coming from the Hartery mine has been very rich, but some pieces were brought to town on Thursday evening that fairly outshone almost any specimen ore we most ever saw. The pieces are on exhibition at Lontzenheiser's drug store. On Friday afternoon some very fine rock was brought up from the J. W. mine, or the Horse Shoe, as we believe it is to be called. There is every reason to believe that the Horse Shoe will be a No. 1 mine. The rock is at Berg's jewelry store.

GOOD MINING PROSPECTS.—Grass Valley *Union*, Oct. 3: The quartz mining situation in this district is improving, as prospecting operations during the summer have been unusually encouraging. The Peabody mine, which has been prospected more or less for several years, is now turning out all the time; lately paid a dividend, and promises to be a reliable mine. The New York Hill, which has not been looking well for a long time, is making improvement, giving encouragement for the future. The Hartley has recently turned out some remarkable rich ore, and those who know say this is only the beginning of the opening up of a rich chute. The Johnson Williams claim, as it is generally called, has turned out some very handsome rock within a few days, coming from the depth of 70 ft. The ledge is not large but the rocks show well in free gold and good sulphurets. The Oakland claim which is near by, on the opposite side of Wolf creek, which is being worked under lease by Thomas Cracklin, is turning out rock that will go $100 per load. There are also several other operations that are looking very well, among which may be named the Roche, formerly the Alpha. The North Star is being re-established by the building of large and permanent works, and in the course of a few months will be worked on a large scale, as there is plenty of virgin ground to open, and there is yet much quartz to be taken out of the old stopes down to the 1300 level. There continue to be rumors that the old Allison ranch is to be started up at no distant day, and there are millions in it yet, all of the old miners of the district believe. The Slate Ledge mine at Forest Springs is a regular producer, and understood to be doing well. At the Maryland mine the work of sinking the shaft is going on steadily, in the expectation of opening up on the same vein upon which the Idaho Co. has so long and so successfully operated. The Magenta Co. has been engaged during the summer in driving a long drain tunnel, with a view to control the surface water which heretofore has been troublesome. The shaft on this mine is down 400 ft., and the prospects have been encouraging. It adjoins the Empire on the northwest. The last named mine is running with a large force, and is paying handsomely all the time. The Idaho, the great mine of the district and of the State, shows no signs of giving out; is working on an extensive scale; paying large dividends every month; and no one pretends to place a limit upon the paying life of the mine; and its use of water-power, which makes a saving of from $25,000 to $30,000 per annum over the former use of steam, is an encouragment to the general introduction of water-power into the district to run mining machinery, which will be attended with the most important results as a factor in reducing the cost of mining, increasing the profits, and stimulating mining activity and prosperity.

A LUCKY MAN.—Nevada *Transcript*, Oct. 2: About six months ago John Hussey purchased a half interest in the Hussey mine at Willow Valley for $3,500 in cash and $3,500 to be paid out of the profits of the mine. Up to this the work of developing the mine has been going on, and about 80 tons of rock has been taken out. Last week Michael Hussey (no relation to John), the owner of the other half of the mine, offered John $14,000 in gold coin for the interest back again, thus giving him a clear profit of $7,000. In time many more as good mines will be developed in the Willow Valley district, as that section contains one vast network of quartz ledges.

A PROSPECTING SYNDICATE.—Some of the miners employed at the Idaho have formed a syndicate and sent two experienced gold hunters to Washington township to find and locate ledges there for them. The boys pay so much a month apiece towards the grub-stake for the prospectors, and the chances are first-rate that their investment will in time bring them big returns. Washington township has some of the best quartz deposits in the county, and the field is comparatively unexplored as yet, so far as they are concerned, for most of the mining up there till within a year or so has been in the gravel line.

MINING SITUATION.—*Tidings*, Oct. 2: For the past eight months there has been a great deal done in the way of prospecting in the Grass Valley mining district, and we are very glad to note that many of the prospects give most flattering indications that soon our hills will bristle with new buildings in the shape of hoisting works and mills erected over mines whose wealth has not, as yet, begun to be touched. "I don't recollect of ever seeing things look so promising in the mining line as they do at present," is an expression that may be heard on all sides, and it is true in every respect. The old mines are contributing their share of wealth to the world, and look no more like being worked out now than they did ten years ago, and are paying as well, if not better, than they ever have done. The Idaho will, in a day or two, declare its 181st dividend, and it will not be of a small amount. The Empire is working night and day, keeping their 20 stamps and their four Triumph concentrators constantly employed. There is plenty of ore in the mine and it is of the very best quality. There are many years of prosperity left for that famous old mine. The shaft is being put down all the time, and is down now to a depth of over 1,500 ft on an incline, with pay ore coming from five levels. The Imperial mine, on Deer creek, is looking better than it ever has, and promises to be a good-paying mine, and that, too, in the near future. The shaft is now down 280 ft and has two drifts running from it east and west. The drifts are in 100 ft each. In about a week a crushing will be made of ore from the east drift, and as the ledge there looks extra good, the crushing is expected to turn out big. The ledge at the Imperial is over four ft thick, and the mine can be very cheaply worked. The Peabody Company are very jubilant over the results of the past six weeks. They now have 1,200 ft of drifts open and are taking out pay ore from three separate ledges. The three ledges combined would make a ledge 13 inches in thickness. The company are now having 30 loads of their ore put through the Omaha mill and the yield is expected to be very large. The New York Hill mine is looking much better than it has been, and gives encouragement of being a good mine. A great deal of work has been done in this mine during the past years and the mine has paid a number of dividends, but in the past four or six months two small assessments have been levied on the capital stock, but the owners now think the mine will very soon turn into a regular dividend payer. Several days since we made mention of the strike of rich ore in the Hartery. The mine has been leased for a time by Jas. Bays & Co., and the boys say they are not at all sorry that they have leased it. The Lone Tree mine, near the Hartery, is being worked by some tributers. The ledge in this mine is about 2½ ft in thickness and much of the ore shows free gold, in fact the free gold, which can always be seen in the ore, gives encouragement for prospecting. As high as $30 per pan has been taken from the decomposed quartz and dirt around the regular ledge. The company expect to have the mine in good shape by spring. The J. W. (Johnson Williams) ledge, which has had a company of prospectors on it for the past month, is now giving out extraordinary encouragement to its owners, and every day rock is being brought to town that abounds in free gold and "black jack." J. J. Dorsey, W. K. Spencer, D. B. Marwick, A. Berg, Wm. Pool, Thos. Cracklin and others have recently incorporated a company for working this mine. At the bottom of the shaft there is a well-defined ledge of beautiful gold-bearing quartz, and it is estimated that it will mill at least $100 per load. Among the richest developments, there is one of exceeding importance—that of the Old William Penn mine, now called the Crown Point. It has been many years since a pick has disturbed the ground in this mine, yet everyone knows that the very richest kind of ore has come out of it. Mons. Gauthier has had such faith in the mine, that single-handed and alone he has erected a water-wheel and pump over the shaft, and has the mine pumped out to the depth of 160 ft. A drift has been run northwest from this shaft on ledge matter. There are four ft of this matter between the walls, and the walls are as smooth as though they had been polished by hand. All of the rock coming out will be hauled to the mill for crushing, for it will pay. Much of the quartz shows very fine gold and abounds in sulphurets and lead. As the drift is being pushed forward the ledge becomes more solid in character, and is of better quality than the ledge in any of the drifts. The miners working in this mine have all the faith imaginable in its success, so much so indeed that they have taken the drift on shares. The Maryland Company are actively at work, their new pumping machinery being completed. This mine joins the Idaho, and the pay chute of the latter is pitching into the Maryland ground. S. P. Dorsey is the principal owner of the Maryland, and the large owners of the Idaho have heavy interests in the Maryland also. The Magenta Company now have their drain tunnel finished and as soon as W. B. Bourn returns from the East it will be decided as to the manner of working the ledge. All is well at the North Star mine, everybody around it being as busy as bees and the work being rapidly rushed to completion. It will be but a short time before steam will be started at the North Star. The Slate Range (Perrin's) is being constantly worked and is turning out pay ore.

Placer.

A RICH MINE.—*Herald*, Oct. 2: Last Monday we visited the mine near the Chinese graveyard about a mile north of Auburn, owned and worked by Holden & Smith. It is now about a year since they struck pay in this locality, and continued development has resulted simply in increasing their prospects. They have the pay in three separate shafts, but have not yet found where the stringers come together and there they anticipate the biggest results. How much money they have already taken out we do not know, but they have certainly a wonderfully rich find. The rock fairly sparkles with gold and the clay in the seams is full of it. On Monday they stripped and took out some four or five pans which, at a low estimate, would go $50 to the pan. There has been little noise made about this mine, but it is certainly one of the biggest finds ever made in this part of the country.

San Bernardino.

CALICO DISTRICT.—*Print*, Oct. 4: One of the chloriders on the Blackfoot mine recently struck a rich pocket of ore containing a ton and a half that netted him $2,200. We were informed that ore that returned about $5,000 was taken out of the old incline made by Kaufman, the former lessee, but which was abandoned because he thought there was no more ore left in the mine that would pay. One hundred tons of ore from the Humbug mine was hauled a few days ago to the Alhambra mill at Hawley's to be crushed. Work is still progressing in this mine, and an immense body of ore is still in sight. The shaft on the Occidental mine is down about 60 ft and is penetrating a rich body of ore. Robt. Anderson and John Ackerman have bought a half interest in the Jesse Tay mine adjoining the Sue, and an entire claim adjoining the former. They have been taking out sufficient ore from this latter claim to repay them for the amount paid for the same. They expect to strike a rich body of ore on the Jesse Tay, as the indications are fine. The Josephine mine is shipping ore to the mill. They are down about 60 ft and drifting into a body of ore that assays high.

SUE MINE.—A very rich vein of ore was recently struck on the north end of the Sue mine. Several weeks ago Chris Kurtz, of San Bernardino, one of the owners, came up to examine the mine. Mr. Kurtz immediately set some men to work, who have been running in a cut to a depth of about 12 ft, and are opening up a fine body of ore that assays from $250 to $1,000 to the ton, and will no doubt mill $200 or $300 to the ton. Several miners who had seen the opening declare it the finest showing they had seen for many a day. The ore contains a great deal of black metal and is uniform in richness throughout the pay streak in the ledge. In another part of the mine a rich spot has been discovered by O. G. Leach, the superintendent. The indications are that rich developments will also be made at this point. The recent rich strikes in this mine have created considerable interest in the camp. Work is progressing on the Snow Bird with most satisfactory results. Considerable ore in sight. Mrs. Townsend has several men engaged in developing the Golconda mine, which improves as they go down. The incline shaft is down to a depth of 60 ft and has opened a body of almost solid ore about 15 ft in width. Three ft of this consists of black ore. Samples across the ledge assayed an average of $56 to the ton; some of the assays went as high as $5,000 to the ton.

Sierra.

BALD MT. EXTENSION.—Mountain *Messenger*, Oct. 2: The Extension Company has completed the drift from the top of the chute, and are taking out gravel from the new ground. The propriety of raising an incline to work this ground expeditiously and economically, is now being gravely considered. If built, this incline will be all in lava, and will be so constructed that a train of eight loaded cars can be lowered at once, and a similar number of empty cars drawn to the top by the descending ones.

PORT WINE.—This old-time mining camp yields a large gold revenue to the national treasury. O. Liberty's mine has done very well this season, considering the small amount of available water. Work has been resumed in the Queen City mines. Timbers are being hauled. Riffle Gold Mining Co., Grass Flat, have their tunnel 800 ft in bedrock. But little work was done this Summer. The noted Pioneer claim is within 100 ft of the Riffle line. By next spring the Pioneer Co. will be up to the line. Watkin and Wm. Prosser, of Port Wine, own most of the stock in these diggings. The Mountain Boy Co., Bunker Hill, near Port Wine, are running a tunnel in blasting rock for a back lead, extension of the Port Wine channel, so rich in early days. The tunnel is now in 100 ft. Two shifts have been put on, and the work will be pushed vigorously. The Prosser Bros. own the larger part of this valuable mining ground. Pioneer Co., Grass Flat, has not done as well this year, with only a profit of $8,000. Total gross yield of mine last four years, $213,000. A tunnel is being run from both ends of the claim for extension of pay channel.

ST. LOUIS.—All the miners have done well hereabout this year. Morgan, Donahue & Cox's diggings yielded handsomely, far beyond the expectations of their fortunate owners. Caledonia claim, Cedar Grove, is still being worked. The main tunnel will be run 3,000 ft back into the ridge where undoubtedly is the extension of the Grass Flat lead.

Siskiyou.

DOWN THE KLAMATH.—In company with several gentlemen, we left the city Saturday to visit the Black Hills mining district. An hour's ride brought us to the Spangler claim, at the mouth of Humbug, where we found a number of men busily at work. The claim is said to be paying handsomely, and from the appearance of the dirt we should judge that it is a veritable bonanza. The drive to Virginia Bar, or Honolulu, was uneventful. We passed many claims that were in operation. Honolulu is somewhat scattered, but is very nicely located and is possessed of considerable life, although the mines are not paying as well as they have in the past. After a night's rest our party arose in good spirits and we departed for the Big Joe claim, some three miles down the river. On our way down we took in the Centennial claim. To one who has never seen river mining it would be hard to form an idea of the great expense attached to opening and operating a river claim. Cribs, dams, derricks and wheels, all indispensable, aggregate a cost that would intimidate most any ordinary man. The Centennial is well equipped, and under its present excellent management will undoubtedly pay big. The next claim down the river is known as the Empire Bar. We are sorry to state that it only pays running expenses but we hope to hear of the owners making a big clean-up before the season is over. The China claim below may be paying, or may be not. Any information you can get from Chinamen concerning their mines you can put in your eye. Arriving at the Fort Jones claim we found a large force at work, and were informed by Chas. Parrott, the Supt., that the mine was paying well, although they are only working surface at present. A mile and a half walk brought us to Joe Cora's claim, which is not paying as large as it should by any means, for if there is any one deserving of success it is Joe Cora. He has expended a large amount of money in the enterprise in the past three seasons. He is working eight men at present, but it being Sunday the claim was idle. Before crossing the ferry we viewed the famous Kanaka claim, which has yielded so largely in its time. It is being energetically worked this season with splendid success. The Freshour claim is in operation, but we did not learn whether it was paying or not. Smith, Johnson & Mann were at work enlarging one of their wheels, the river being so low that the water did not reach the paddles. Arriving at Wm. McConnell's claim we were shown all the important features of that justly celebrated mine, not the least being the electric light plant. Mr. McConnell is running two derricks, and is getting rich about as rapidly as any man in the county. He is working large forces, and most of the time superintends the claim personally. His mine is the richest and most extensive on the river, and his mining machinery is unsurpassed by any in Northern California.

NEVADA.

Washoe District.

OPHIR.—Virginia *Enterprise*, Oct. 4: A considerable amount of ore is still being extracted from the fillings of the old drifts on the 250 level, which ore is being sent to the mills. The west drift on the 500 level is being advanced at the rate of about 70 ft per week, and the south drift on the 1500 level at the rate of over 60 ft per week.

HALE AND NORCROSS.—The north drift on the 2800 level is still being pushed forward in the direction of the Savage south line. The material has changed somewhat, but still shows a good deal of quartz. Of late signs of water have been increasing and it is necessary to use caution in advancing the drift. Rapid progress is making in the incline below the 2800 level. It is cutting the east side of the vein as it goes down, the dip of which pretty nearly corresponds with the angle at which the winze is being sunk. Last week they extracted from the 200 level and shipped to the Eureka mill, Carson river, 594 tons of ore and received from said mill bullion to the value of $7,723.06.

BENTON.—The north drift on the 2150 level is being driven forward for the vein as fast as possible. It is occasionally necessary to stop for a short time and allow the water to run down.

ALTA.—The main east drift on the 2150 level is being advanced as rapidly as can be done under the circumstances. The rock does not blast well—breaking short—and at times a good deal of water is tapped when it is necessary to halt for a time until the flow has decreased. They have now passed the point where it was expected that the most water would be found. All this water doubtless comes from the ore vein which they expect to soon reach.

BEST AND BELCHER.—The north drift on the 825 level is in vein porphyry, which has been quite hard, though good headway is being made. There is no water in this ground. On the 2500 level the west cross-cut is cutting through quartz, clay and porphyry. The quartz is of fair appearance, but carries very little metal. The cross-cut will be carried ahead until an undoubted west wall is reached.

UNION CONSOLIDATED.—On the 3200 level the joint Ophir, Mexican and Sierra Nevada winze has been sunk to a sufficient depth below the 3300 level for a sump. The work now in order is the cutting out of a station at the 3300 level and the running of a cross-cut to the westward. Already they are at work upon the station and are making good progress, though the rock does not blast out very well.

SAVAGE.—The joint Norcross drift on the 2800 level is making about 30 ft per week. The ground into which the drift is being advanced is becoming somewhat wet, but no very large flow of water is anticipated. The quartz encountered is of a promising appearance.

ALPHA.—The upraise is now about at the 500 level. Here a station will be made, and the large body of quartz they have been following from the 400 level thoroughly explored. This quartz yields very encouraging assays. Cross-cuts are still being run in this same body of quartz on the 600 level.

ANDES.—The north drift from the winze shows plenty of quartz and occasional bunches of ore are found. The main north drift is in quartz of a fine appearance. Cross-cutting is now in order. The quartz yields promising assays.

COMBINATION SHAFT.—The shaft has reached the 3000 level, and is now being sunk below that point to a depth sufficient for a sump. Next in order will be the cutting out of a station at the 3000 level in which to place the new hydraulic pump.

YELLOW JACKET.—The old upper levels are still yielding a considerable amount of low-grade ore, and this yield may now gradually be increased with the increased volume of water in the Carson river.

CON. VIRGINIA AND CALIFORNIA.—The northwest drift on the 1700 level is making good headway, and is in material of a very favorable appearance. Cross-cutting from this drift will soon be in order.

BELCHER.—As the volume of water in the Carson river increases the amount of ore extracted is also increased. A considerable amount of exploring work is being done.

SCORPION.—The north drift on the 500 level is being pushed forward as rapidly as possible. It is in vein porphyry, with some streaks of quartz and seams of clay.

CROWN POINT.—The amount of ore extracted is gradually being increased as the rise of water in the Carson river allows of the running of additional stamps.

SUTRO TUNNEL.—*Enterprise* Oct. 4: Following is the report of progress and details of work in the Sutro tunnel during the month of September: Main tunnel—Since last report the repairmen have retimbered and made sundry repairs at the follow-

ing points: Between the 100 and 2,840 have removed 128 posts and 68 caps of old timber, squared ground and put in place 173 posts and 70 caps of new timber, relagged and braced old and new sets, repaired guard planking along the side of the track, cleaned out drain boxes and cleaned up and removed debris. Between the 11,300 and 11,400 have placed 124 new cross and 5 side plank on drain boxes. Between the 18,200 and 10,400 have relagged old sets and cleaned up debris. Retimbering has been finished at the following points: 1,200 1,400, 1,-900, 2,600 and 2,300. At the 1,200, begins 2 ft 9 inches east and extends in the same direction 75 ft 9 inches; at the 1,400, extends east 42 ft 9 inches and west 6 ft 2 inches; at the 1,900, extends west 88 ft 6 inches and east 61 ft 6 inches; at the 1,000, begins 20 ft 8 inches west and extends east 10 ft 2 inches; at the 2,300, begins 10 ft 6 inches west and extends east 40 ft 4 inches.

Lewis District.

NEW MILL.—*Messenger*, Oct. 2: George W. Bothwell arrived at Battle mountain, Monday, from San Francisco, with the machinery for a new mill that is going to build for the Pittsburg Con. M. Co., at Lewis. He expects to begin work immediately, and will soon have the mill up and in running order. Cardwell and Morgan have made arrangements to run the mill all winter on ore from their mine, of which there is an abundance in sight. We expect to record numerous bullion shipments from Lewis this fall and winter.

Osceola District.

WATER.—Cor. Pioche *Record*, Oct. 2: Jim Mathewson, just over from Osceola, says that it is a fact as to Bishop Black of Deseret, Utah, having secured a contract from the Godbe Placer Mining Co. to bring water to the digging through a large ditch, the distance being some 12 miles. The Bishop, with a large force of Mormons, are expected every day; also Mr. Eastmond, who will superintend the erection of whatever fluming is required on the ditch. I have been informed, by good authority, that J. C. Turner, Superintendent of the Osceola Mining Co., made a proposition not long since to the company he represents as to purchasing their mill, and that his offer had been accepted. Our informant also stated that Mr. Turner was negotiating with Capt. Akie and Boone Tilford with a view toward working their mines. As Mr. Turner is a practical mining and mill man, and as Messrs. Akie and Tilford have good mines, and the mill as fine as there is in the State, Osceola may boom yet.

Sacramento District.

MILL CITY REDUCTION WORKS.—*Silver State*, Oct. 2: The new reduction works built by Gould & O'Donnel at Mill City made a run on ore from the Humboldt Queen mine, in Sacramento district, with very satisfactory results. M. S. Thompson, from whom this information was derived, says that the works had to shut down in consequence of the scarcity of water for amalgamating purposes, until a new well, which is being sunk, is completed.

Sherman District.

AT WORK.—Reno *Journal*, Oct. 3: Jim Burke came in from Sherman district yesterday. He has not yet got his hoisting works up, but has a force of men at work at it. He hopes to get everything in shape before the weather gets cold, so that work may be continued uninterruptedly all winter. Out of curiosity the other day he had an assay made of a 3-ft streak of talcose substance found about 30 ft below the surface, and to his amazement got a return of over $500 in silver. He will now run a drift in on this streak and see what it amounts to.

Silverado District.

RUNNING SMOOTHLY.—Eureka *Sentinel*, Oct. 2: John Killen is in from Silverado and reports that camp as running smoothly. He has a lease of all the Queen mine above the 100 level, and has lately struck a small seam of rich ore which grows large as development work progresses. This is in a drift run in virgin ground west of the shaft. The Jones brothers have also struck high grade ore on the 160 level, and had taken out from the find two sacks of ore just as Killen left.

Taylor District.

A BRISK CAMP.—Cor. Eureka *Sentinel*, Oct. 3: Taylor, however, is quite a brisk little place, and one of the healthiest mining camps in the West. Miners receive $4 per day, and have to contend with no lead or foul air. Both the mines are paying handsome dividends, especially the Monitor, which, beyond doubt, is the best paying property in the State. The Argus mill, which has been undergoing repairs, started up on the 20th, and Supt. Carothers expects to make a three months' run before shutting down again. As I write a large body of passably fair ore has been tapped in the Neptune, one of the Argus group of mines. The property joins the Monitor ground on the west, and the strike referred to proves conclusively that there is a large mineral belt running parallel with the camp, and which is liable to be as rich as the Monitor.

ARIZONA.

NOTES.—Prescott *Courier*, Oct. 3: Mr. Van Name, of Big Bug district, is here and tells us that Mr. Schofield is the gentleman who is going to run the new gold mill and concentrators, which S. J. Egbert will shortly put in place. Supt. Eaman will see that the Tuscumbia mill is started, Tuesday next, on ore from the Lane mine, of which there are nearly 200 tons ready for crushing. A. J. Moore, just from Jerome, tells us that the United Verde Co.'s furnace is making a great deal of copper silver bullion and that another furnace will soon be set up and run. Mr. Moore says the company is one of the best in the country. Superintendent, bosses, all are very easy with employes. Barney Martin reports progress in Antelope and Weaver districts. Mexican placer miners continue to make fair wages, by washing the gravel. R. W. C. Merrington says that his Queen Mab mine is opening up well. Chicago mine, Groom Creek district, is being opened by shafts. Lessees of the Kimball mine, Lynx creek, are stoping out ore and working concentrates. Considerable ore is being shipped from Dosoris and Turkey Creek district.

COLORADO.

SUMMIT.—Red Mountain *Miner*, Oct. 4: The Summit is owned by J. P. Johnson, J. G. Gray and J. Burdette. Is situated in Dry gulch, near the divide between it and Humboldt. Is developed by a 65 ft cross-cut tunnel; a 20 ft drift on the lead and a 30 ft shaft. In the latter at a depth of 22 ft, a 10-inch streak of very pretty galena and copper ore was encountered, and in the 8 ft that it has been followed has widened out to 18 inches. Character of ore where first encountered was a carbonate with numerous boulders of galena, assays of which gave 34 ounces silver with a fair percentage of lead. Nearly all the Dry gulch properties have carbonate deposits near the surface, and without an exception as yet, as depth is gained, they run into solid ore. Caledonia shaft when filled by hand slide was done some 20 ft. Owners concluded that the better plan would be to abandon work of cleaning it out and to start a cross-cut that would enable them to tap ore body at some depth. Accordingly, work was commenced at some distance below the shaft, and the tunnel is now in about 40 ft. It is thought that 45 ft of additional driving will tap mineral. Ore is worth about $50 per ton, but the body is so large that it will pay handsomely to mine it. Work on the Sailor Boy has been prosecuted steadily since May last. Workmen were driven out of lower workings recently by water, but started a drift on the large ore body that cropped out on the surface. One car-load of 140 ounce ore has already been shipped, and large quantity on dump from which daily shipments are being made. Another rich strike of high-grade mineral was made a few days since on the Yankee Girl, at a point some 12 ft above the bottom of the shaft, and designated as station No. 3. Mr. Schwarz states that the mineral is as high-grade as any yet found in the mine, and there is 6 ft of it. Tunnel on the Denver in Humbold gulch now in 75 ft. Owners think they are almost under the lead and expect to cut it at any time. Rock has been found much harder than anticipated, otherwise the tunnel would have been much farther in.

IDAHO.

THE IDAHOAN.—Wood River *Times*, Oct. 2: W. H. Nye, the well-known Boise druggist who is a fourth owner in the Idahoan mine, and mill, was in town to-day. He reports himself highly pleased with the way the mine is being worked, and says that it is looking better now than it ever did. About three months ago the owners concluded upon a change of policy. Heretofore the mine had been as if on dress parade, with huge blocks of ore in sight that they seemed afraid to touch. It looked as if they were afraid of digging it out. But about the time stated they determined to start in and try to knock the bottom out. They began taking ore out and shipping it to Kansas City. They have taken out and shipped an average of one car-load per day for over two months, and the mine looks better and better. Where the ore in the drifts has been blasted and removed, it shows up wider in the bottom, and thus justifies greater hopes for the deeper workings. The workings have, however, got so deep, that the hand windlass with which all the hoisting has been done must soon be laid aside and replaced with machinery. This will be done this fall; and Superintendent Edgington and the owners will endeavor, from this time on, to keep the Idahoan where she should be, to-wit: in the very front rank of Wood River properties.

THE CAMAS NO. 2 MILL.—Wood River *Times*, Oct. 2: Last week the timbers for the mill which is to be erected on Big Camas No. 2 mine, up Croy gulch, about 10 miles from Hailey, were ordered. This mine was sold a few months ago to capitalists of St. Joe, Missouri, for $10,000 cash. The ledge is said to be over 100 ft in width, and the ore assays $40 in gold per ton.

A PAYING PLACER CLAIM.—J. B. Hunt, a prospector who has been down on Snake river for a little over a year, is making quite a success of his placer claim, earning an average of $50 per day, with two men, or about $17 per man per day. He is running but one machine—a cheap grizzly with burlap sluices, and cleans up between $140 and $175 worth of gold every three days. In June he cleaned up $1,400, in July $1,500, in August $1,200, and this month he has already cleaned up over $1,200. Mr. Hunt will have two other machines in operation in about a month, and his clean-ups thereafter will doubtless aggregate $3,000 per month. Mr. Hunt's claim is near Salmon Falls.

THE EAST FORK OF WOOD RIVER.—Ed. Brown came in from the East fork, yesterday, and went out to Lost river to-day to work on the copper smelter being erected there. He reports striking a 5-ft iron ledge showing six inches of galena, at the head of the East fork of Wood river, which he located for himself and Q. A. French, of this city. There were over 200 men working along the East fork in July and August, and over 100 men are still steadily employed there. Mr. Brown thinks very highly of the East fork, and believes that in time it will be equal to Bullion as an ore and bullion producer.

MINERAL NOTES.—Cor. Idaho *World*, Oct. 3: The camp is looking up and the boys all in good cheer. Development on the Black Hawk mine is moving steadily on, by Duffy, Kelly & Co. The Black Sam mine is showing up splendidly, and work on the same being in progress. The Daniel Boone, that has been lying still all summer, has again opened her batteries, and a general cannonading can be heard under the supervision of Peck & Giger. Messrs. Campbell & Stein are piling out rich ore for milling on the dumps of the Wide Awake and Muldoon. Keatts Brothers are packing down high-grade ores from the S. G. Hull mine to be worked by Stein & Co., which we know will be a success. The mill under the supervision of Mr. Stein, has been a success thus far, and as he is now prepared for working under a different system we have all reason to believe that it will prove a great benefit to the camp, as he aims to put it to its full capacity.

MONTANA.

THE BEST ROAD TO THE NEW MINES.—Helena *Independent*, Oct. 2: Mr. W. S. Wetzel, of Benton, arrived in the city yesterday. For the benefit of those who have been misgnided, an *Independent* reported immediately sought Mr. Wetzel to learn some facts concerning the gold excitement of the Little Rockies. He reports great excitement in all the northern country over the mining discoveries. The diggings are said to be very rich and a general stampede has set in for them from Benton and vicinity. The mines are situated about 130 miles north of Benton and the best road to them lies through that city. Mr. Wetzel says that there is a good wagon road the entire distance, the larger portion of it being the Benton and Fort Assinaboine stage line.

LITTLE ROCKIES.—*Inter-Mountain*, Oct. 2: News from the Little Rockies is that Alder gulch continues good and there are probably lots of other good paying gulches in the vicinity, if the pilgrims who are crowding into the mines would only look for them instead of begging for grub among the claim owners who have no more than enough for themselves. All the miners now taking out gold are fairly well supplied with provisions, but they are not prepared to supply the whole country, or even their "host of friends," and it is therefore advisable for all persons going to the mines to take with them a full outfit of provisions and tools, or else remain at home.

ENCOURAGING REPORTS.—Butte *Inter-Mountain*, Oct. 4: The tendency of the past few months has been to the development of an unprecedentedly large number of new properties which have hitherto been undeveloped—claims upon which the owners have done simply the assessment work necessary to the obtainment of a patent. Large numbers of these hitherto idle claims are now being worked by men of small capital but indomitable energy, and the result is seen in the increased bank accounts of the workers, an enlarged bullion output for the camp and a decided improvement in the sales of our merchants. This happy state of affairs is due largely to the improved milling facilities that now obtain over the methods formerly in use, and the improvement is destined to grow in proportions until each now undeveloped claim will add its little quota to the bullion proceeds and to the amount of business transacted in our midst. The general prosperity of the community might be considerably increased if many of the mining men of experience and known ability in the camp would avail themselves of the numerous opportunities offered of leasing valuable prospects instead of, Micawber-like, "waiting for something to turn up."

LEXINGTON.—At the Lexington, cross-cutting south for the vein on the 650-ft level has been going on for some time past, and from the flow of the water in the level, the proximity of the vein is assured, it being thought that it will be encountered to-day. From the other levels ore of the usual grade is being hoisted out. At the mill everything is running along smoothly, the whole property, in fact, being in a most satisfactory condition. President Renevy, in company with Superintendent Wartenweiler, has given the plant and mine a thorough inspection, and it is altogether likely that improvements of an extended character may be made.

ALICE.—The grade for the new Cornish pump is about completed, and a large force of men are now at work on the pit for the mammoth machine. Some idea of its magnitude may be formed from the dimensions of this pit, it being 85 ft long, 18 ft wide and 20 ft deep. The bob pit at the 300-ft station is being pushed to completion and will be finished in about two weeks. While excavating the pit above mentioned a very nice body of ore was uncovered, assaying high in value. On the 300-ft level of the Alice a body of very rich ore, literally plastered over with silver, is being stoped out. Both mills have of late been doing very satisfactory work, and the tonnage crushed last month was the largest accomplished since the starting up of the machinery, it aggregating the grand total of 3,032 tons, which, allowing for a day's stoppage, averages considerably over a ton to the stamp every 24 hours.

BELL.—At the Bell operations are now being prosecuted on the 500 ft level and shipments uninterruptedly made to the smelter.

RISING STAR.—Sinking for the 400 ft level is actively progressing, and it is thought that by Monday next the vein will have been encountered. On the 200 ft cross-cut they have struck the vein, showing a very large body of satisfactory ore.

HECLA.—*Inter-Mountain*, Oct. 6: The erection of the third furnace at the Hecla Company's smelter is actively progressing under the personal supervision of Mr. Knippenburg. The daily smelting capacity will thus soon be increased to 60 tons. The Hecla Company now controls a group of the best mines in Montana, and has not missed a monthly dividend since '81. No mining enterprise in the country is conducted on a more legitimate and business-like basis than the Hecla.

NEW MEXICO.

GOLD HILL DISTRICT.—Silver City *Enterprise*, Oct. 2: During the past three weeks rumors of a new find have repeatedly come to our hearing, but not until Sunday last were we informed of the exact location. On Saturday last Robert Black and T. E. Parks returned from the western portion of the Burro mountains and gave us the particulars of the discovery, which they with others are interested in. Accompanied by Jesse Davis and David Egelston the above mentioned gentlemen went on a prospecting tour about the 10th of September in the Burros. They prospected the country to the west of Soldiers' Farewell pretty thoroughly and fonud some carbonate ore, samples of which they brought to town and had assays made which give returns of 43 ounces silver and a high percentage of lead. They determined to return and work the carbonate property, and for that purpose they left here with a large supply of provisions and tools. On their way to their find they came upon two prospectors named Winter and Johns, both well known here, and learned that another man was also in the vicinity prospecting. They inquired if any mineral had been discovered, and on receiving a very evasive answer, concluded to prospect for themselves at that particular point which is several miles from the place of their first discovery. They were not long in convincing themselves that mineral of good grade abounded in the vicinity, but of an entirely different character from that found by them on their previous visit. The formation in which the mineral was found is synite and granite, the leads cropping out largely in many places, and to their surprise carried more gold than silver. In many places free gold was found. Both parties were employed constantly for several days, prospecting and staking out claims until they were satisfied that they had a sufficiency of ground and mineral, when they proceeded to carefully sample the ledges of their first claims. Care was taken not to select pieces in which gold could be seen for assaying. Many rich specimen pieces were selected and brought into town, and created a stampede of prospectors for that section when shown here. There is said to be about 100 men, prospecting in the vicinity and to the east and west of there at present. The ore brought in, which is an average of the ledge, runs $57.08 in gold and silver in one assay and $51.33 in another. Our informants say that they can mine the ore and haul it to Lordsburg, a distance of 12 miles, at a very small cost. The ledges are said to be from 10 to 40 ft in width. The great draw-back to the camp at present is the scarcity of water, which has to be hauled about 10 or 12 miles. When this is overcome, look out for a boom. The discoverers met and organized a district, calling it the Gold Hill mining district. They also arranged to sink a well in the vicinity. Encouraging reports are coming in daily from the camp. Malone and Rattlesnake City are almost deserted at present. Lordsburg is afire with the fever.

UTAH.

A NEW STRIKE.—Salt Lake *Tribune*, Oct. 4 Westerly from the Read & Benson and easterly from the Sailor Jack and Carbonate mining claims, and near the south fork of Big Cottonwood, there have recently been discovered and opened some very rich and promising prospects of large veins of galena and carbonate ore. The name "Tecumseh Group" has been given to the new discovery, and it is the opinion of our informant that the six claims comprising the group will equal, if not rival, their once famous neighbors in the output of ore. For 1,000 ft on the strike, in four different openings, the ore has been exposed in width from three to eight feet, assaying from 30 to 200 ounces silver and from 30 to 60 per cent lead. The lucky owners, Messrs. Beerson, Johnson and others, are jubilant and well they may be.

PARK CITY NOTES.—Salt Lake *Tribune*, Oct. 3: The Sampson shipped last week to the sampler 26,-370 pounds of ore. The lessees of the Bonanza shipped last week 21,920 pounds of first-class ore. The Apex has shipped ore to the amount of 27,100 pounds during last week.

REVIEW.—Salt Lake *Tribune*, Oct. 3: The output of bullion from Utah for the nine months of 1884 that are gone by, including some from Idaho, and excluding all ores, was as follows as per our regular reports: January, $449,228.74; February, $364,-606.47; March, $460,366.60; April, $432,809.44; May, $343,416.15; June, $539,532.90; July, $530,978.35; August, $526,393 83; September, $522,283.49; total, $4,169,615.95. This, as we have heretofore stated, does not include the work of several large producers, which make no reports till the close of the year. For the week ending October 1st, inclusive, the receipts of ore and bullion in this city amounted to $170,112.30, of which $126,702.30 was bullion, and $43,500 ore. The week previous the receipts were $132,531.99, of which $118,341.99 was bullion and $14,290 ore. The receipts for the week from the Horn Silver were 15 cars of bullion, $45,000, bringing the total output of this mine for the year up to $1,896,-000. The product of the Ontario for the week was 52 cars of bullion, of the value of $38,996.30; making a total output this year to date, $1,279,238.20. The Crescent sent down two lots of ore during the week, valued at $8,950. Mr. Withey, down from Park City, says the Crescent tramway is now finished. The concentrating mill was up, but setting the machinery is delayed by the Cornish rolls failure to arrive. They were ordered with the other machinery, but not being carried in stock, it seems they had to be made. The mine looks better than ever, and has long been sending down 50 to 60 tons of ore per day. The Northern Chief seems to have lost its grip just as it got ready, after four years of preparation to do something. We learn that the property is attached, and we suppose because the owners refuse to "put up" any longer. With the mine well opened, lots of ore out, and a new mill, just ready to operate, it looks to spectators like a bad time to weaken. It is indeed curious how men go into a scheme like this with enthusiasm, and all their friends not in think they are being badly left, spend $100,000 may be, and then let all go to pot rather than put up another $100. At the New Emma we learn that Capt. Cullens has got up steam, and is now ready to pump out the water, if, indeed, it is not being done. We look for something in or near the bottom of this shaft, to revive the reputation of that famous property, and the camp on the head of Little Cottonwood, the pioneer mining camp of Utah. Mr. J. H. Dupaix of Minersville was up recently to get a few stamps to work ores from what is called the John Kemple mine in South Star district, about 12 miles from Milford. The location is 600 ft wide by 1,500 ft long, and has four parallel veins striking east and west, and within 150 ft of each other. They seem to be independent veins, in limestone, and so far are dry ores. Three of them are thin but very rich, in and out, 2 to 6 or 8 inches, $300 to $500 rock. The fourth is thicker, 2 or 3 ft, averaging $35 or $40. The deepest working is an incline 50 ft. Mr. Dupaix thinks he doesn't get a fair price for his ores in this market. Hence he is going to try to work it himself, on a small scale at first, increasing his plant as results may justify.

WASHINGTON.

CLE-EL-UM MINES.—Cor. Kittitas *Localizer*, Sept. 27: The Bullion M. Co. have their incline shaft now at the depth of 140 ft. Good ore continues all the way down. On account of the last snow-storm, work in the mine has been laid over until next spring. Purdy Flint has some men working assessments on the Made'eine, Black Hawk, and other property he owns in the district. B. B. Kelly and E. P. Boyles are building a cabin near the Silver Bow, in which they intend to remain this winter and prospect some copper claims they own. The ore is copper pyrites and oxides, the assay value of which is 40 or 50 per cent copper, and about $35 gold and silver per ton. The ore bodies vary from 3 to 8 ft in thickness. The owners of the Morning Glory mine have sunk an incline shaft 44 ft. The ledge at the bottom has increased to the width of 5 ft solid ore with a clay gauge on the foot wall 7 inches wide. The Morning Glory has proven to be a well defined and true fissure vein; the foundation is granite schist. There have been several other new discoveries made this season which are looked upon as valuable properties. The owner of one claim says he is not excited, but nothing less than a homestake will change the ownership of his mine. It is the intention of the miners of this district to commence early next spring to cut a good pack trail and wagon road up the Teanaway to the mines, for they are convinced they have the ore that will pay and plenty of it.

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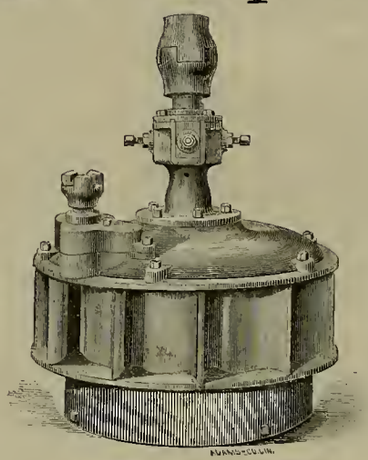
Points of Superiority:



FIRST.—Simplicity, being composed of the smallest possible number of parts.

SECOND.—The Wheel, Outer Case, Register Gate, and Top, each being one casting, and all the work on them being performed by machinery, and fitted to a standard gauge, secures the highest perfection in construction and operation, and the utmost strength.

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FOURTH.—The conical interior of the wheel, which secures perfect freedom of vent for both tiers of buckets, enabling the wheel to rid itself immediately of "dead water" without friction. This feature is entirely original with this wheel, and is found to be of very great practical importance.

FIFTH.—Its "Duplex Chute," formed by the Register Gate and outer case. The outer case moulds the current of water, delivering it in a solid body through that part of the Chute comprised in the Register Gate on to the wheel. This Chute being fixed, the direction of the current is never changed, nor its velocity checked, consequently nearly the same per cent. of power is obtained with the gates only partially drawn as when fully open.

SIXTH. A Gate thoroughly protected from vertical pressure, which, when partially closed, does not break the column of water or change its proper direction, which is easily operated, and yet shuts so tight as to prevent leakage; and the shutting of which is not likely to become obstructed or prevented by foreign substances.

SEVENTH.—The housing up of the pinion and segment for operating the gate, which entirely prevents all danger of breakage by foreign substances getting between the teeth. No other concern does or can use this improvement, which effectually does away with a source of most frequent annoyance and delay.

EIGHTH.—The amount of power it yields, together with its Simplicity, Durability and Strength, fairly entitles our wheel to the name given it, The Eclipse Turbine. In further proof of the power of this wheel, we invite a careful inspection and comparison of our tables with corresponding tables for all other similar wheels.

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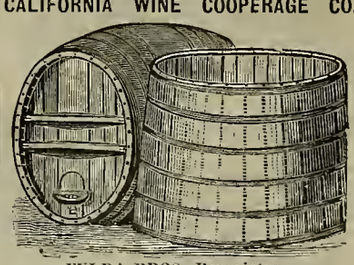

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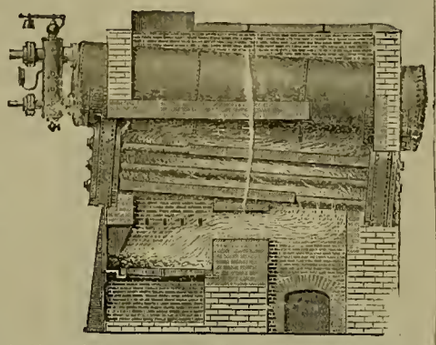

TESTIMONIALS.

ST. LOUIS, MO., Sept. 28, 1883

Messrs Adolphus Meier & Co. GENTLEMEN: We cheerfully certify that the "*Heine Patent Safety Boiler*" put up by you in our establishment has proved very satisfactory in its working The chief points of excellence in the "Heine Safety Boiler" are its economy in fuel and space, freedom from scaling, aptitude for power and heating purposes, working equally well with clear and muddy water. We warmly recommend it to all using steam machinery. Yours truly,

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OFFICE OF SUPT OF ROYAL RAILWAYS, BERLIN, Sept. 23, 1883.

To Mr. H. Heine, Civil Engineer: In reply to your inquiry of September 2d, we respectfully inform you that the three boilers built under your patents, under steam since September 25, 1881, at the Alexander Place Depot, as well as the two at Friedrich Strasse Depot, under steam since September 22, 1882, have given good satisfaction, requiring no repairs whatsoever to date. The internal cleaning of the boiler was always accomplished with ease on account of the convenient arrangement of the tube caps, the adhesion of scales being fully prevented thereby, and the boilers kept in prime condition.

(Signed): BRAUCKE.

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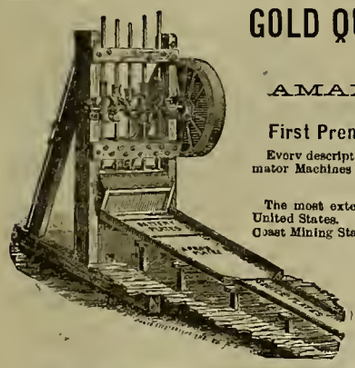

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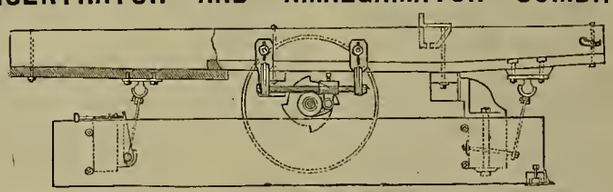

This machine requires less power, less care or attention, and is less liable to get out of repair than any Concentrator now in use. All of which any practical miner will comprehend when seeing it in operation.

The wear and tear is nominal, and the construction so simple that any miner can put it up and run it; and the low price brings it within the reach of all millmen, as it will save enough to pay for itself in any mill in a very short time. One machine will concentrate the tailings from a five-stamp battery.

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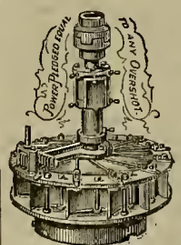

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Mining Share Market.

The mining stock market shares the depression of general business, which, added to its former dullness, makes stock matters very uninteresting. Prices change very little and the volume of business is small. On the Comstock, at the north end the joint winze of the Ophir, Mexican, Sierra Nevada and Union Consolidated has reached the point to which mining men have long been looking forward. The winze is completed to a point which gives sump room below the 3300 level, and at said level a working station is at present being excavated, from which explorations will be made to the westward. This cutting across the Comstock lode at the great depth of 3,300 feet below the surface is a work which will not only interest all mining men but also all the experts and all the geologists and scientists who have ever examined the vein formation and the temperature and stratification of the country rock adjoining. Being the greatest depth attained on the American continent, if not in the whole world, this new level will naturally attract the attention of all scientific tourists passing this way.

At the Ophir they will soon be making interesting explorations on the 500 and 1500 levels. In the old bonanza mines a northwest drift is now being run on the 1750 level, which will pass through ground and drifts which will doubtless eventually connect with the explorations about to be commenced in the Ophir.

In the Best and Belcher and Gould and Curry explorations in ground not heretofore prospected, work will soon be commenced on and above the 825 level. At Gold Hill the leading companies are now able to increase their forces of men, and consequently the amount of ore extracted and milled. The Overman is now coming in among these mines with a goodly yield of low-grade ore from its old upper levels.

Bullion Shipments.

Hanauer, Sept. 30, $5,550; Wood River ore, 30, $2,550; Christy, 30, $1,795; Vienna, 30, $3,150; Horn Silver, 30, $15,000; Ontario, 30, $10,379; Vienna, Oct. 1, $3,182; Ontario, 1, $5,745; Horn Silver, 1, $6,000; Hanauer, 2, $3,750; Crescent, 2, $4,850; Horn Silver, 2, $6,000; Ontario, 3, $5,435; Day, 3, $3,861; Hanauer, 3, $3,650; Wood River ore, $4,700; Horn Silver, 3, $9,000; Ontario, 3, $5,505; Christy, 3, $3,100; Vienna, 3, $3,214; Day, 4, $4,058; Ontario, 4, $11,729; Horn Silver, 4, $9,000; Hanauer, 5. $3,850; Crescent, 5, $4,000. The bullion shipments from Butte, Montana, for two weeks ending Oct. 3rd, aggregated $275,835, by far the largest output yet achieved in the silver product by the camp in the same space of time. Paradise Valley, 4, $4,011; Barner district, Idaho, 4, $10,000; Silver City, Idaho, 4, $2,218; Grand Prize, 3, $6,500; Bodie, 2, $1,286; Bonanza King, 4, $7,970; Contention, 3, $8,201; Navajo, 6, $14,000. The banks of Salt Lake City report the receipt for the week ending October 1st, inclusive, of $126,712.3e in bullion, and $43,500.58 in ore; a total of $170,212.88.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superviser Court, Department 10, San Francisco:

HORSESHOE M. Co., Oct. 6. Capital stock, $500,000. Directors Wm. K. Spencer, J. J. Dorsey, Thomas Cracklin, David B. Marwick and Alfred Berg. This is a Grass Valley Company.

DELHI M. Co., Oct. 6. Capital stock, $1,000,000. Location, Columbia Hill, Nevada county, Cal. Trustees—Robert McMurray, Niles Searls, Edward Stafford, A. S. Bigelow and Walter S. Bigelow.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
J. J. BARTELL—Sacramento Co.
A. C. KNOX—Nevada (State).
B. W. CROWELL—Fresno and Tulare counties.
GEO. MCDOWELL—Amador and Calaveras counties
WM. PASCOE—San Francisco.
WM. H. COOK—Los Angeles Co.
H. G. PARSONS—Montana and Utah.
G. W. INGALLS—Arizona.
D. K. BRAMBLE—Humboldt and Del Norte Co.

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ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Arnold G & S M Co	Arizona	2	50	Aug 1	Oct 1	Oct 28	A Judson	320 Sansome st
Alta S M Co	Nevada	30	50	Aug 21	Sept 25	Oct 15	W H Watson	302 Montgomery st
Andes M Co	Nevada	25	25	Sept 23	Oct 28	Nov 20	B Burris	309 Montgomery st
Butte Creek Hyd M Co	California	10	10	Sept 23	Nov 6	Nov 29	R L Taylor	230 Montgomery st
Cheva Santa M Co	Mexico	3	05	Sept 13	Oct 15	Oct 31	W L Oliver	328 Montgomery st
Champion M Co	California	15	10	Aug 22	Sept 26	Oct 16	T Wetzel	522 Montgomery st
Con Imperial S M Co	Nevada	21	10	Sept 1	Oct 7	Oct 23	C L McCoy	309 Montgomery st
Caborca M Co	Mexico	9	03	July 18	Nov 1	Dec 1	C Bovie	328 Montgomery st
Daisy Cement M Co	California	2	02	Sept 26	Nov 8	Nov 29	C J Collins	512 Montgomery st
Day S M Co	Nevada	15	75	Sept 26	Nov 3	Dec 2	E M Hall	327 Pine st
Exchequer W & M Co	California	7	50	Sept 2	Oct 1	Oct 28	W J Stewart	215 Sansome st
Eintracht Gravel M Co	California	15	05	Aug 26	Sept 1	Oct 18	H Kunz	209 Sansome st
Indian Spring Drift M Co	California	3	03	Sept 17	Oct 18	Nov 15	A B Paul	328 Montgomery st
Justice M Co	Nevada	41	15	Sept 11	Oct 11	Nov 5	R E Kelly	412 California st
North Gould & Curry M Co	Nevada	7	25	Sept 3	Oct 6	Oct 23	C H Mason	331 Montgomery st
Peerless M Co	Arizona	2	25	Sept 25	Nov 3	Nov 29	A Waterman	309 Montgomery st
Solid Silver M Co	Nevada	4	10	Sept 25	Oct 25	Nov 12	R Hewson	5 First st
Sterling M Co	California	1	05	Sept 18	Oct 23	Nov 20	W H Allen	306 Pine st
Savage M Co	Nevada	60	50	Sept 5	Oct 7	Oct 27	E B Holmes	309 Montgomery st
Summers Con M Co	California	1	05	Aug 18	Sept 22	Oct 16	F E Luty	330 Pine st
Tunitas Petroleum Co	California	2	1.00	Sept 29	Oct 31	Nov 15	S F Springer	601 California st
Utah S M Co	Nevada	50	50	Aug 18	Sept 22	Oct 11	C Pratt	309 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Con Virginia M Co	Nevada	C W Havens	309 Montgomery st	Annual	Oct 15
California M Co	Nevada	C P Gordan	309 Montgomery st	Annual	Oct 15
Exchequer M Co	Nevada	C F Elliott	309 Montgomery st	Annual	Oct 20
Eureka Con M Co	Nevada	E H Willson	323 Montgomery st	Annual	Oct 20
General Lee M Co	Nevada	C E Gillett	434 California st	Annual	Oct 18
Happy Valley M Co	California	D M Kent	330 Pine st	Annual	Oct 24
Ithaca Con M Co	California	W Grainger	402 Montgomery st	Annual	Oct 11
Syndicate M Co	California	J Stadfeldt	419 California st	Annual	Oct 16
Silver West M Co	Nevada	F R Bunker	424 Montgomery st	Annual	Oct 15

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	G W Sessions	309 Montgomery st	50	June 5
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Aug 26
Idaho M Co	California			4.00	Apr 2
Jackson M Co	California	D C Bates	309 Montgomery st	10	Mar 16
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 21
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Apr 28
Standard Con M Co	California	Wm Willie	309 Montgomery st	25	Mar 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Sept 5

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept 18.		WEEK ENDING Sept. 25.		WEEK ENDING Oct. 2.		WEEK ENDING Oct. 9.	
Alpha	1.50	1.65	1.40	1.60	1.45	1.95	1.40	1.60
Alta	1.60	2.35	1.65	2.20	1.90	2.10	1.55	1.95
Andes	.20	.25	.20	.25	.10	.15	.10	.15
Argenta	....	....	....	....	....	....	....	....
Belcher	.80	.90	....	.80	.90	1.00	.85	.90
Belding	....	....	....	....	....	....	....	.10
Best & Belcher	2.20	2.40	2.15	2.30	1.85	2.20	1.90	1.95
Bullion	....	.50	....	....	....	.40	.25	.30
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	....	.55	.55	.60	.50	.55	.30	.50
Bodie Con	2.00	2.05	1.95	2.10	2.00	2.40	2.05	2.35
Benton	.50	.70	.50	.60	.50	.50	.45	.60
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	....	.50	....	.55	.50	.65	.60	.65
California	.30	.35	.30	.35	....	.30	.35	.40
Challenge	....	....	....	....	....	.20	.20	.25
Champion	....	....	....	....	....	....	....	....
Chollar	2.20	2.45	2.10	2.50	2.10	2.35	2.05	2.15
Confidence	1.00	1.00	....	1.00	....	1.20	1.00	1.25
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	.20	.25	.20	.25	....	.20	.15	.25
Con. Pacific	.60	.65	.60	.90	.50	.65	.60	.90
Crown Point	1.30	1.35	....	1.30	1.20	1.50	1.40	1.60
Day	....	....	....	.05	....	.05	....	....
Eureka Con	2.75	3.00	3.25	3.30	....	3.00	2.90	3.10
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	.35	.40	.30	.80	.25	.35	.25	.35
Grand Prize	....	.40	.40	.45	.35	.40	.30	.40
Gould & Curry	1.95	2.15	1.80	1.95	1.40	1.30	1.20	1.45
Goodelsaw	....	....	....	....	....	....	....	....
Hale & Norcross	2.85	3.25	2.85	3.25	2.85	3.05	2.50	2.90
Holmes	....	2.75	....	....	2.75	3.00	2.50	3.50
Independence	....	.25	....	....	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	....	.20	....	.15	.10	.15	.10	.15
Martin White	....	....	....	....	....	.50	....	.30
Mono	.90	1.40	1.05	1.40	1.30	2.00	1.35	1.80
Mexican	1.60	1.85	1.55	1.80	1.50	1.70	1.20	1.55
Mt. Diablo	....	....	....	....	2.40	3.00	3.00	3.25
Northern Belle	....	....	....	....	....	....	....	....
Navajo	3.55	3.90	3.60	3.75	3.00	3.60	3.55	3.70
North Belle Isle	....	....	.30	.40	.35	.40	.40	.45
Occidental	1.30	1.60	1.30	1.40	....	1.25	1.10	1.25
Ophir	1.30	1.40	1.30	1.40	1.15	1.30	1.05	1.20
Overman	....	....	.15	.20	....	.15	.15	.20
Potosi	1.35	1.60	1.30	1.50	1.35	1.35	1.00	1.25
Final Con	....	....	....	....	....	....	....	....
Savage	1.20	1.45	1.25	1.40	1.00	1.20	.85	1.35
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	1.45	1.60	1.40	1.35	1.35	1.50	1.25	1.40
Silver Hill	....	.10	....	.05	....	....	....	....
Silver King	....	4.50	....	....	....	4.25	4.10	4.25
Scorpion	....	.25	....	.20	.20	.25	.20	.25
Syndicate	....	.45	.40	.45	.45	.50	....	.45
Tioga	....	....	....	....	....	....	....	....
Union Con	1.25	1.35	1.25	1.35	1.15	1.30	1.05	1.20
Utah	.70	.85	.75	1.30	1.10	1.30	1.05	1.20
Yellow Jacket	1.95	2.00	1.75	2.00	1.75	2.00	1.80	2.00
	....	....	....	....	....	....	....	....

PROGRESS IN SCIENCE.—The developments of physical science have received a wonderful impetus within the last ten years. Twenty odd years ago, according to the chief literature on opthalmology, we find very conflicting opinions entertained by many eminent physiologists regarding the pathology of the eye when accommodation was not understood nor the cardinal points of physiological dioptrics. Astigmatism of the eye is very often treated for amblyopia, amarosis, etc., while it is a mechanical defect, and can be corrected by simple or compound lenses correcting the errors of refraction. Many to this day don't comprehend the difference of refraction or accommodation. Old sight, or presbyopia, is ranked with a faulty formation, and the belief still exists in the minds of many that as a person grows older the eyes fatten. Having tested over 2,000 complicated cases of defective sight in the last three years, which I have a record of, I confidently solicit all who are troubled with painful forebodings of loss of sight and defective vision, inflammation of the eyes, to avail themselves of my professional services free of charge.

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Sales at San Francisco Stock Exchange.

THURSDAY A. M., Oct. 9.			AFTERNOON SESSION.		
300 Andes	10c	150	Alta	1.65	
250 Bulwer	.65c	60	B. & Belcher	1.80	
150 Bodie	2.20	460	Benton Con	50c	
100 B. & Belcher	1.75	455	Bodie Con	2.20	
50 Benton	.50c	100	Bulwer	.65c	
50 Chollar	2.00	1000	California	.35c	
300 Con. Virginia	.20c	100	Chollar	2.00	
100 Con. Pacific	1.00	100	Grand Prize	.35c	
650 Exchequer	.25c	400	Hale & Nor	2.45@2.50	
200 Grand Prize	.35	100	Mexican	1.35	
300 Gould & Curry	1.15	300	Mono	1.60	
400 Hale & Nor	.2.45@2.50	235	Ophir	1.10	
100 Mono	1.65	50	Overman	.15c	
100 Mexican	1.30	250	Potosi	1.05	
300 Ophir	1.00	150	Syndicate	.50c	
100 Occidental	1.25	50	Sierra Nevada	1.25	
80 Potosi	1.10	100	Savage	1.25	
100 Savage	.25c	50	Utah	1.00	
380 Sierra Nevada	1.25@1.30	50	Yellow Jacket	1.90	
550 Union	1.05				

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Oct. 9, 1884.

ANTIMONY—Per pound		@	
Hallett's		13 @	—
Cookson's		14 @	—
BORAX—Refined		9 @	9½
IRON—Glengarnock ton	25 00	@	—
Eglinton, ton	24 00	@	—
American Soft, ton	25 50	@	—
Oregon Pig, ton		— @	—
Clipper Gun, Nos. 1 to 4	30 00	@32	50
City Lane White	22 50	@	—
Shotts, No. 1	26 00	@	—
Refined Bar		3 @	5½
Boiler, 1 to 4	5 00	@	5 50
Plate, 5 to 10		4½@	4¾
Nail Rod		7 @	—
Norway, according to thickness		6 @	7
STEEL—English, B		16 @	25
Black Diamond, ordinary sizes		14 @	—
Drill		15 @	—
Machinery		12 @	14
COPPER—Ingot		15 @	16
Brazers' sizes		18 @	39
Fire-box sheets		28 @	—
Bolt		23 @	25
Old		12½@	15
Bar		— @	—
Cement, 100 fine		12 @	—
Copper in New York, Oct. 8		12½@	—
LEAD—Pig		3 @	4
Bar		5½@	—
Pipe		7 @	—
Sheet		8 @	—
Shot, discount 10% on 500 bag s: Drop, ₱ bag.		2 00 @	—
Buck, ₱ bag		2 20 @	—
Chilled, do		2 40 @	—
TIN PLATES—Charcoal		7 00 @	7 25
Coke		5 75 @	6 75
Pig		19 00 @	20 00
Banca tin		22 @	23
I. C. Charcoal Roofing, 14x20		6 25 @	6 50
Zinc, German		8 @	10
Sheet, 7x3 ft, 7 to 10 lb, less the cask		9 @	10
QUICKSILVER—By the flask		30 00 @	—
Flasks, new		1 05 @	—
Flasks, old		85 @	—

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & CO.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.]

FOR WEEK ENDING SEPTEMBER 30, 1884.

305,831.—EXPLOSIVE SHELL.—J. L. Bachelder, Globe, A. T.

305,788.—OXIDIZING FURNACE—John R. Brett, Oakland, Cal.

305,902.—CHAIN PUMP—Geo. W. Derrick, Centerville, Or.

306,012.—VALVE FOR WASH BASIN TRAPS—C. W. Garland, Oakland, Cal.

305,816.—ENGINE GOVERNOR—John L. Heald, Crocket, Cal.

305,818.—DYE VAT—C. A. Hoffmann, S. F.

305,833.—MOWING MACHINE—C. W. McKelvey, Portersville, Cal.

305,846.—WORKING AURIFEROUS ARSENIDES, ETC.—E. Probert, S. F.

305,849.—TAILORS' SQUARE—S. G. Rugland, S. F.

305,852.—CHIMNEY CAP—M. Scholl, S. F.

305,857.—STRAM BOILER AND SEDIMENT COLLECTOR COMBINED—J. Spaulding, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CAR COUPLING.—Thos. H. McNamee, Le moore, Tulare Co. No. 303,394. Dated Aug. 12, 1884. It consists in a draw-head, provided with a vertically moving and guided coupling pin, adapted to be raised by means of oscillating crank levers extending to the sides and held in a raised position, and tripped to effect its fall by means of a horizontally moving spring latch-plate, operated by the impact of the opposing draw-head. Connected with and operated by the coupling pin is a vertically moving spring plate, adapted to bear upon the rear end of the link and hold it in a straight position. With this coupling it is unnecessary for the brakesman to go between the cars in coupling them.

REVERSIBLE PLOW.—Alfred H. Fitch, Santa Cruz. No. 303,715. Dated August 19, 1884. This reversible plow has a peculiar construction of beam-handles and frame-work, the beam forming an axis upon which the plow standards are journaled, and about which the plows revolve when reversed; gears and a crank, or lever-arm, by which the plows may be reversed, and supporting and adjusting mechanism. The object of the construction is to obtain cheapness, lightness and strength in a reversible plow.

GRAIN SCOURER.—John C. Hunt, Chico, Butte county. No. 303,734. Dated Aug. 19, 1884. This invention relates to an apparatus for scouring or cleaning grain from foul surface matter and woody fiber, which embodies a series of rings or disks, having peripheral teeth mounted close together and parallel upon a horizontal rotary shaft with an inclosing case, through which a blast of air is drawn by a suction-fan, and through which the grain also passes by a spiral feed. The case is perforated, and an outer case indorses it at a short distance so as to form a passage between the two for the air current which may also pass into the inner cylinder through the perforators. Gates or valves control the air current, and suitable discharge openings are made for the cleaned grain and the reflex.

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May we suggest as the result of a long experience in the manufacture and use of Oil, the following facts:

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Some of the Leading Business Houses of Helena.

Our correspondent who is now in Montana, in addition to the notes in another column, sends in the following concerning the business interests.

CONRAD, MUTH & BACH, dealers in general merchandise and miners supplies. Also proprietors of Marysville stage line.

CLARKE, CONRAD & CURTIN, wholesale and retail dealers in iron, steel and nails, stoves, tin and hardware, etc., Main street.

RALEIGH & CLARKE, wholesale and retail dealers in dry goods, notions, ladies' and children's suits, millinery, etc., Main street.

J. FELDBERG, dealer in ready made clothing and gents' furnishing goods, Main street. Cheapest and best quality for little money.

FRED. LEHMAN, wholesale and retail grocer and commission merchant, and dealer in wines, liquors, tobacco, hardware, etc., Main street.

GREENHOOD, BOHM & CO., wholesale and retail dealers in clothing, gents' furnishing goods, hats, caps, trunks, valises, notions, etc. Also wholesale liquor, cigar and tobacco dealers.

WM. G. BAILEY & CO., dealers in diamonds and rich jewelry. The finest establishment in this line between St. Paul and Portland, Main street.

T. H. CLEWELL, dealer in news, stationary, school books, notions and fancy goods, cigars, etc.; SCIENTIFIC PRESS on sale, Main street.

SHAFTER & WELTER, architects, builders and general contractors, lower Main street. Especial attention to architectural work.

R. S. HALE & CO., dealers in mining chemicals, lubricating oils, etc., Main street. Large stock carried.

W. E. NORRIS & Bro., manufacturers of finest confectionery, and dealers in confectioners' supplies, nuts, oils, extracts, cake ornaments, etc. Also fine cigars, Main street.

THOMAS J. LOWRY, attorney at law, Main street.

B. F. MARSH, U. S. Deputy Mineral Surveyor, Brown's block, Warren street.

W. W. De Lacy, Deputy Mineral Surveyor and City Engineer, opposite Surveyor General's office.

T. C. POWER & CO., wholesale and retail dealers in agricultural implements, wagons, buggies and farm produce. Branches at Bozeman and Missoula.

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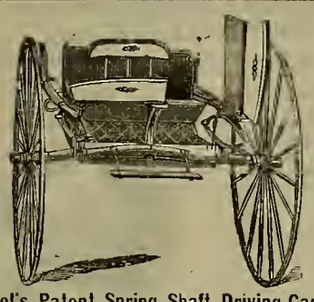
The Lamphire Gold Mine and Milling Com-

pany Location of principal place of business, San Francisco, Cal.; location of works, Tuolumne Mining District, Tuolumne County, Cal.

NOTICE is hereby given that at a meeting of the Board of Directors, held on Friday, the third (3d) day of October, 1884, an assessment (No. 1) of ten (10) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the President, David McClure, at the office of the company, room No. 2, No. 526 Montgomery street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on Monday, the tenth (10th) day of November, 1884, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the first (1st) day of December, 1884, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

ADDISON MARTIN, Sec'y.

OFFICE.—Room No. 2 No. 526 Montgomery Street, San Francisco, California.



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California Inventors

Should consult DEWEY & CO AMERICAN AND FOREIGN PATENT SOLICITORS, for obtaining Patents and Caveats. Established in 1860. Their long experience as journalists and large practice as Patent attorneys enables them to offer Pacific Coast Inventors far better service than they can obtain elsewhere. Send for free circulars of information. Office of the MINING AND SCIENTIFIC PRESS and PACIFIC RURAL PRESS, No. 252 Market St., S. F. Elevator 12 Front St

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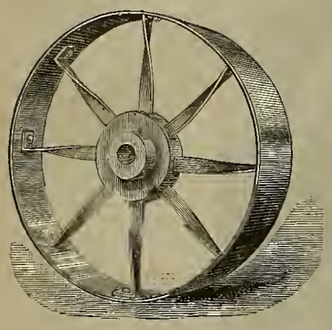
STEEL PULLEY.



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They are less than half the weight of cast-iron pulleys; are polished on the face; are made either crowned or straight, and are turned in the lathe the same as the best make of cast-iron pulleys.

They are carefully balanced. They are subject to no contraction strains, and can be run at very high speed without danger of bursting.

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They are very true, and are about 50 per cent lighter than the cast-iron pulleys in our No. 1 mill.

Yours faithfully,
For the Mather Lane Spinning Co. (Limited),
[Signed:] RICHARD T. MARSH,
Managing Director.

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Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.
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Mold-Board AMALGAMATORS,
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irst St., between Howard & Folsom, S. F.

COKE. PATENT. COKE.

This COKE is exclusively used by Prof. Thomas Price, in his assay office, by the Selby Smelting and Lead Co., Prescott, Scott & Co., Risdon Iron and Locomotive Works and others in this city. Large supplies are regularly forwarded to consumers in Salt Lake and Nevada, to the Copper Queen Mining Co., Longfellow Copper Mining Co. and other consumers in Arizona.

The undersigned are in receipt of regular supplies from Cardiff, Wales, and offer the COKE for sale in quantities to suit purchasers.

BALFOUR, GUTHRIE & CO.,
316 California St., San Francisco.

THE DUNCAN CONCENTRATOR

BEYOND QUESTION THE
Cheapest and Most Effective Machine
OF THE KIND NOW IN USE.
Adapted to All Grades and Classes of Ores

This machine has been thoroughly tested for the past two years under a great variety of conditions giving most extraordinary results, far in advance of anything ever before realized.

A recent competitive test made with the Frue at the Carlisle mine, in New Mexico, showed an advantage of 30 per cent in favor of the Duncan. The amount saved over the Frue being sufficient to pay the entire cost of the machines nearly every month of the year. The following is an enumeration of its many advantages over all other similar machines:

1. Its cost is not more than half that of any other of equal capacity, and the weight is nearly 1,000 pounds less, thus greatly reducing the cost of transportation.
2. The expense of setting up in running order is not more than one-third that of the Frue, or any other belt machine, much less grading and timber work being necessary.
3. The expenditure for repair is not more than one-fifth that of any belt machine, and they will last fully three times as long, working under the same conditions.
4. Not more than one-half the space is required—a point of great importance where a considerable number are used.
5. No special skill and very little care is necessary to operate it.
6. No more water is required than is furnished by the batteries.
7. It saves all the amalgam, gold or silver, that escapes the batteries, pans or settlers—AN INVALUABLE FEATURE, and claimed by no other, making the machine worth more than it costs for this purpose alone.
8. A much coarser grade of ore can be handled successfully than by any other machine—a great advantage in many instances where fine crushing is not necessary to eliminate the mineral.
9. It has no small and delicate mechanism, requiring nice adjustment and the closest attention—an insuperable objection to all belt and other forms of machines, making them wholly unfit for the rough service of a quartz mill.
10. Great simplicity of construction and small number of wearing parts. The whole machine is comprised in 17 pieces, only 3 of which are subject to any especial wear, and these can be replaced at a nominal cost. The Frue has 113 pieces, and some similar machines many more, making a complication of parts that involves constant repair and great expense in this way, as well as in loss of time.

We are aware that the most sweeping and pretentious claims are made for nearly every concentrator in the market, but it is a well-known fact that the results of their operation have not in any instance made good these claims. The advantages here set forth for the Duncan, as well as the statements made, we are prepared to substantiate by actual working results. **Price, $350. Weight, about 1,750 pounds.**

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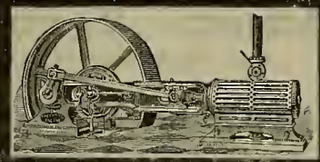

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Awarded highest premiums at Cincinnati and Louisville Expositions of 1883, for "Best Automatic Engine." We will furnish anyone copies of the ORIGINAL ENTRIES of several engine builders who claim they were not competing with us. They all entered in the same class with us, and now by deceptive Circulars (one headed "Fact versus Falsehood,") attempt to mislead.

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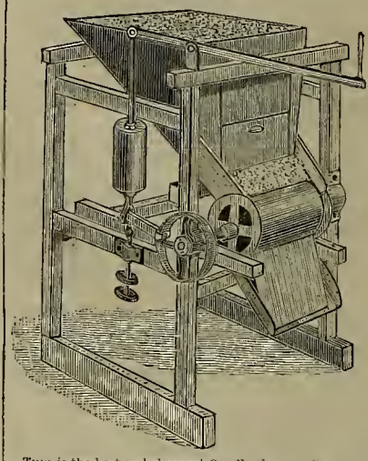
Jobbing Promptly Attended to.

THE ROLLER ORE FEEDER
[Patented May 28, 1882.]



This is the best and cheapest Ore Feeder now in use.

It has fewer parts, requires less power, is simpler in adjustment than any other. Feeds coarse ore or soft clay alike uniformly, under one or all the stamps in a battery, as required.

In the Bunker Hill Mill it has run continuously for two years, never having been out of order or costing a dollar for repairs.

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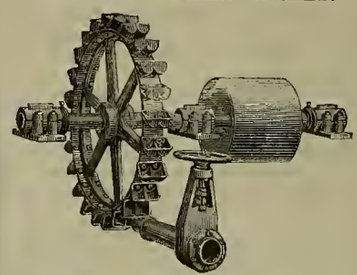

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Invaluable to those engaged in dry crushing quartz mills, quicksilver mines, white lead corroding, feeding thrashing machines and all occupations where the surrounding atmosphere is filled with dust, obnoxious smells or poisonous vapors. The Respirators are sold subject to approval after trial, and, if not satisfactory, the price will be refunded.

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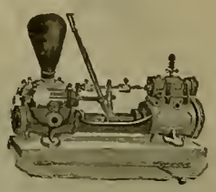

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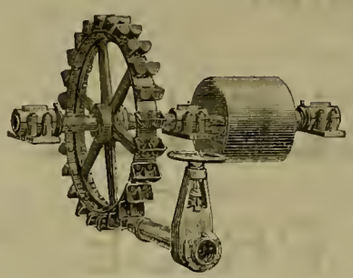

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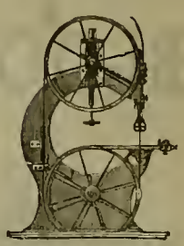

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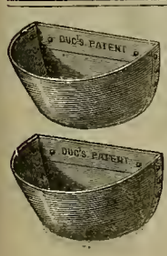

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Extra Strong and Very Durable.

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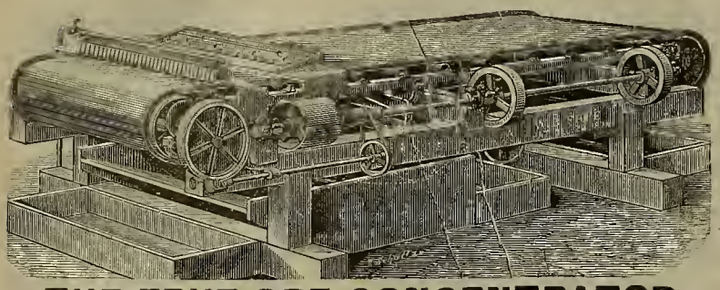
$1,000 CHALLENGE!



THE FRUE ORE CONCENTRATOR,
OR VANNING MACHINE.

PRICE: FIVE HUNDRED AND SEVENTY-FIVE DOLLARS, ($575 00), F. O. B.

OVER 1,000 ARE NOW IN USE. Saves from 40 to 100 per cent more than any other Concentrator. Concentrations are clean from the first working. The wear and tear are merely nominal. A machine can be seen in working order and ready to make tests at the Fulton Iron Works, No. 220 Fremont Street, San Francisco.

As the result of a suit East against an End-Shake Machine (the Embrey), similar to the Triumph, the Frue Vanning Machine Company owns the Embrey patent, and can put in the market an End-Shake Machine of earlier patent that will do as good work as the Triumph, and superior in construction and durability. There will be no risk of suit for infringement.

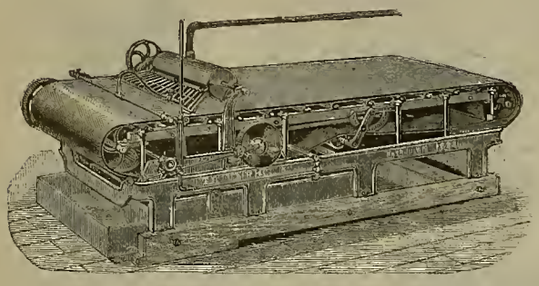
The Frue Vanning Machine Company warn the public that they claim and will prove the Triumph machine to be an infringement on patents owned by them.

Protected by patents May 4, 1869, Dec. 22, 1874, Sept. 2, 1879, April 27, 1880, March 22, 1881, Feb. 20, 1883, Sept. 18, 1883. Patents applied for.

N. B.—We are and have been ready at any time to make a competitive trial against the Triumph, or any other Concentrator for stakes of $1,000.

ADAMS & CARTER, Agents Frue Vanning Machine Co.,
Room 7—No. 109 California Street, - - - SAN FRANCISCO, CAL.

$1,000 CHALLENGE ACCEPTED!



THE
"TRIUMPH" ORE CONCENTRATOR.

PRICE, FIVE HUNDRED AND FIFTY DOLLARS ($550.00), F. O. B.

THE "TRIUMPH" TRIUMPHANT!

In a competitive trial recently had between two of the **"Triumph" Ore Concentrators** and the same number of **"Frue" Vanning Machines**, at the mill of the celebrated gold producing Original Empire Mill and Mining Company, in Grass Valley, Nevada County, Cal., the "Triumphs" produced thirteen and fifteen one-hundredths (13.15) per cent more concentrations than did the "Frue" Vanners, during a run of twenty-four consecutive days, or a net gold coin result of $199.15, or $8.30 per day, in favor of the two "Triumph" Concentrators.

These returns do not include the value of the amalgam saved by the "Triumphs" during the test; which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarily saved, which is lost on the "Frue" Vanners.

This trial was conducted under the personal supervision of the Manager and Superintendent of that Company, in a strictly fair and impartial manner, and with the sole view of determining, in the interest of that Company, the merits and demerits of the respective machines by a thoroughly practical test. A relation of the course of procedure, a concise analysis of assays, and a tabulated statement of the net bullion results, with accurate deductions therefrom, will soon be published in Circular form.

The superiority of the present construction of the "Triumph" over the form originally introduced, together with the demonstrated results of the above, and other trials had with the "Frue" Vanners, induce us to and **we hereby accept the Challenge of $1,000**, flaunted by the Agents of the "Frue Vanning Machine Company," and hold ourselves in readiness to enter into a second competitive trial for that sum, at such place and upon such terms and conditions as may hereafter be mutually arranged.

We guarantee purchasers against all costs, expenses or charges incurred by reason of any infringements of any existing patents.

"Put up or shut up," and "Let the Best Machine win!"

JOSHUA HENDY MACHINE WORKS,
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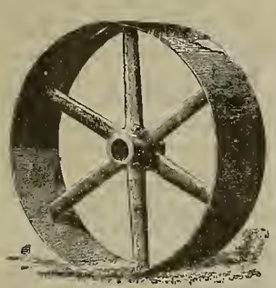

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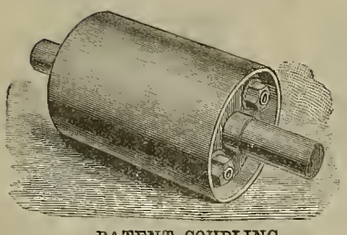
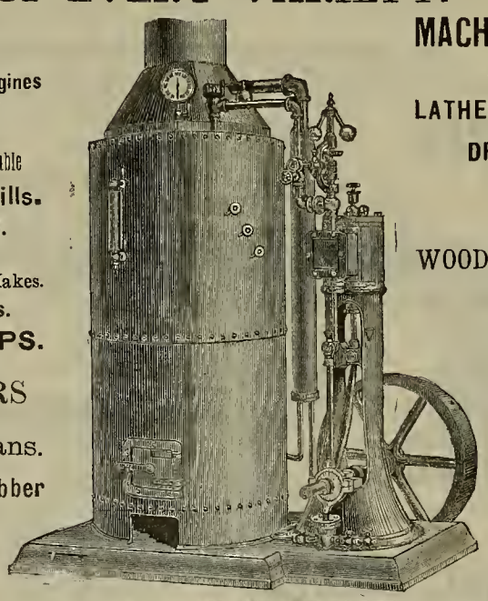


PATENT COUPLING.



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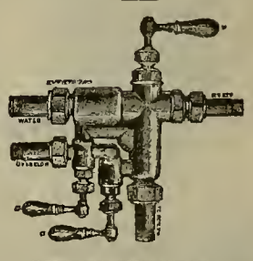

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MINING, QUARTZ, AND SAWMILL MACHINERY.

AUTOMATIC ORE-FEEDERS, HENDY AND TRIUMPH CONCENTRATORS.

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MINING AND SCIENTIFIC PRESS.

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BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, OCTOBER 18, 1884.

VOLUME XLIX. Number 16.

Transferring Cable Cars.

At the ends of cable railroads are placed cargo sheaves, around which the cable passes to return, there being four tracks and two tubes. In order to transfer the cars from one track to another, at the end of the route, two turn-tables are arranged, the diameter of each being a little less than the distance between the centers of the two sets of tracks, each turn-table having two rails across it, equidistant from the center. These two tables are geared together, so that by turning one through an angle of ninety degrees the two sets of tracks will be brought in line with each other, and a car which had previously been brought from one of the lines of rails on to the table, can be pushed on to the other table, and then, by reversing the movement of the tables, the tracks are brought in line with the main line, and the car can then be moved on the opposite track, and on its return journey.

In transferring ordinary cars from one track to another, the tables would be simple plates placed on central pivots, and supporting rolls around the circumference; but the car which carries the gripping apparatus and is called the dummy, having the shank of the grip projecting downward and through the slot into the tube, would in this case have to be raised out of the tube to allow the dummy to go on the turn-table. This operation would not only require time, but the expenditure of considerable labor. That these might be avoided, the table on the Clay street road was constructed of two parts, an upper and lower plate connected together by ribs or ties. The top plate has a slot across its diameter, and the space between the upper and bottom plate will allow the lower portion of the grip to pass through—the ties between the two plates being far enough apart for the grip to pass through without touching. Now, as shown before, by revolving the tables one quarter way round, the slots, through the upper surface of the plates, are brought in line with each other, and the dummy can, with its grip, be pushed from one table to the other, and so on to the other line of rails.

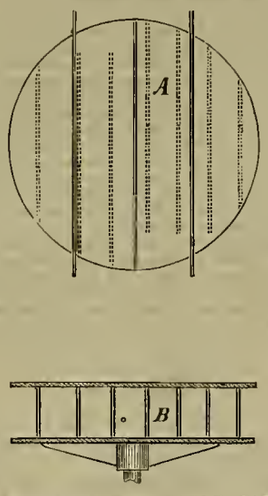
There is still one other requirement, and that is, that the cable shall also pass through the table, so that the dummy may be drawn on to the table and then dropped; and in order that this may be effected, the cable is carried through the table and some convenient distance beyond before passing around the large sheave. Now the connection between the upper and lower plates of the turn-table must be so located that the table may be revolved through one-quarter of a circle without bringing this connection in contact with the cable, which is continually moving through.

In the engraving, which, with the description, are from Mr. W. W. Hanscom's paper on cable railroads, read recently before the Technical Society of the Pacific Coast, A is a plan of the turn-table; B is a vertical section at a right angle to the slot which divides the top plate; C is a vertical section in line with the slot through the top, and shows the manner in which the ties between the two plates are arranged so as to allow the cable to pass freely through when the cable is turned so as to allow the car or dummy to pass from one table to another. Simple as this seems now it is used, it took some ingenuity to devise the plan.

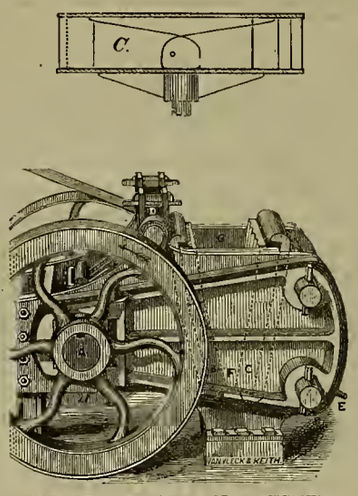
The Brodie Quartz Crusher.

An engraving herewith illustrates Brodie's quartz crusher. The power being applied through the belt (which must be open and must run loose and without a tightener) in the direction indicated by the arrow in the engraving, the shaft is caused to revolve, and by the eccentric to oscillate the jaw *B*.

The oscillation consists in a double motion resulting from the action of the eccentric and the pendulous motion of the links *D*, which cause the point *B* to rise while enlarging the opening *E*, and to fall while closing the opening. This double motion of the jaw, which is not possessed by any other crusher without infringing on the patent of this one, causes a rotation of the pieces of rock while the pressure of the jaw is being applied to them, thus overcoming the force of cohesion, and crushing the rock in the easiest possible manner and with the least expenditure of power.



TURN-TABLE FOR CABLE CARS.



THE BRODIE QUARTZ CRUSHER.

That the power required by this crusher is small is evident from the size of the belt used. The largest size of Brodie's Crusher runs with a ten inch belt quite slack, which may be reduced to six inch and yet do satisfactory work—while some other crushers of the same size require a fourteen inch belt drummed up as tight as possible. The inventor requires that the belts of his crusher shall always be run slack, in order to insure against accident, in case a gad or pick should fall between the jaws. Whenever this happens, the sudden strain throws the slack belt from the pulley and stops the machine—which would not occur if the belt was drummed tight on the pulleys.

When it becomes necessary to renew the hard iron dies in the jaws, they can be taken out; being easily loosened by backing out the wrought iron keys. The zinc filling should then be cut out and the new dies set in their places, having their joints luted with fine clay to prevent the lining metal from running out when it is poured. A good reservoir should be built of the clay around the hole in the top of the jaw. This will insure the perfect filling of all the crevices between the dies and the jaws. The side dies are changed by taking out the bolts which hold them. They can be easily drawn from their places and new ones put in their places. Four sizes of these crushers are made by the California Machine Works (Wm. H. Birch), 119 Beale street, in this city, the size of the opening between the jaws running from four inches by six inches to eight inches by eighteen inches.

A Mining Consolidation.—A meeting of the stockholders in the California and Consolidated Virginia Mining Companies was held Wednesday, at which 141,782 shares of the former company and 388,063 of the latter were represented. It having been resolved to unite the two incorporations in one, the necessary deeds were passed, and the new company was styled the "Consolidated California and Virginia Mining Company." The election of a board of directors and officers for the ensuing year was then proceeded with, and resulted as follows: President, Charles H. Fish; Vice-President, R. H. Follis; A. B. Hull, C. O'Connor and George Congdon. A. W. Havens was appointed Secretary, J. S. Angus, Treasurer, and W. H. Paton, Superintendent. The stockholders of California will receive 2¼ shares of the new issue for each share of the original stock held by them, and holders of Consolidated Virginia will receive 1 1-6 shares of the new issue for each of their original shares. The new stock will be called in the San Francisco Board this morning, and the stock will be ready for issue to-day. A rumor prevails on the street that Sierra Nevada, Union, Mexican and Ophir will follow the example of California and Consolidated Virginia.

The Idahoan mine, seven miles west of Baily, Wood river, Idaho, has been sold for $400,000. The purchaser is Count de Barranca, of London, England. The purchase includes the Idahoan, Idaho Fraction, Belmont, Richmond and Hawkeye lodes in Idahoan gulch, and the Forest Queen in Kelly gulch, and two mill-sites and one water-right in Bullion gulch.

The Bay Horse and Challis regions are now tributary to Ketchum, Idaho, as are likewise the new Lost river camps.

Publication of Mining Notice.

In applying for patents for mining claims, it is necessary for the applicant to publish his intention of applying for patent, in a local paper. A case has recently come before the Commissioner of the U. S. Land Office in which an overcharge has been made for these publications, and he takes the subject up in a somewhat vigorous manner. A gentleman who published his notice in a Colorado paper writes to the Commissioner that in the "copy" furnished the paper all courses and distances were given in figures, which the publisher changed into words, refusing to make any deduction from the cost on account of the extra space thus taken up, although charging the maximum price of fifty cents per line. His excuse is that his office did not contain sufficient figures to "set up" the notices as given to him, and he was compelled to use words. The Commissioner expresses the opinion that this proceeding savors of extortion, and is evidently an attempt to evade the regulation established by authority of Section 3334 Revised Statutes. If the notice issued from the local Land Office was so changed as to add to its length by the substitution of words for figures, the charge being the maximum allowed by law, every line so added and charged for was an imposition upon the applicant for patent. While the publisher's reason for making the change in the notice may have been valid, it was no excuse for adding to the cost of publication.

The Commissioner says: "A newspaper in which such changes are made for the purpose of making an additional charge for publication, can hardly be characterized as "reputable," nor can it be regarded as a fit medium for the publication of the notices required by the mining laws which it disregards. As stated in paragraph 88 of the mining circular, such abuses will not be tolerated."

The Register and Receiver is instructed to tell the publishers that the notices sent must be followed in the published copy, or, if necessarily changed in the manner stated above, no charge must be made for the excess so occasioned. Also, that any overcharge made in the manner above described must be returned to the applicants from whom it has been obtained. In case of the refusal of the publisher so to do, he is told to cease to regard the paper as a "reputable newspaper of general circulation," or to direct the notice of publication therein.

The air compressors of the old Justice works on the Comstock have been sold to go to Quijotoa, Arizona. The Virginia *Enterprise* says that these would probably never again have been used by the Justice Company had they been kept at their works. When the Justice folks resume work it will doubtless be through the Alta shaft. Their own works are left nearly half a mile behind the point to which the lode has been followed by the Alta and Benton companies.

The Little Wood River Mining and Smelting Co., Idaho, have 40 men at work in the mine and concentrator. They take out 40 tons of ore per day, of which 10 tons is first-class ore not concentrated. The balance goes through the concentrator with the other ores, and then to the company's smelters. The smelters are turning out an average of five tons of bullion every 24 hours.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS

Discharge of Stamp Mill Batteries.

EDITORS PRESS:—Under the above captiou, iu your issue of 4th instant, you give a description of an alleged invention intended to facilitate the discharge of ore from a battery.

From the descripton given I caunot see in what particular this contrivance differs from one which I described, and I think illustrated, in your paper uiany years ago, which I mentioned in "Testing Gold and Silver Ores" which I have frequently meutioned, always with commendation in my various writings on the subject of milling, which I first saw and used in the Picacho mill in Lower California in 1866, which I used in Mono county in 1874 or thereabout, and which I put into the Kearsarge mill in 1876 where however it did not work, so well, owing to a slight dampness of the ore. The arrangement I speak of was a screen of four, eight, or ten meshes to the running inch in the side of the mortar, the ore passing through it and falling on a fine screen, also attached to the battery and consisting of wire gauze extended on a frame as wide as the discharge of tbe battery, and five or six feet long, which lies "with the surface upward" and through which all particles which are fine enough pass, and fall into a V trough below in which is a screen conveyerwhich carries the fiue ore to an elevator by which it is raised to the roasting furnace. The fine screen is so inclined as that all particles which cannot pass through it may slide over it, and fall into a receptacle whence they may be returned to the battery either automatically or hy hand. The jar imparted to the fine screen by the dropping of the stamps is generally sufficient to make it do its work, but a "joggler" may be employed if necessary. In the Picacho mill, four stamp, we crushed six tons per day through a 40 mesh sieve. The removal of the fine ore to the furnaces, and return of the coarser portiou to the battery, was done hy hand.

In tbe Kearsarge mill, the fine ore passing througb the apron iuto the V trough was screwed to the elevator, and tbe coarse was returned by haud to the battery, the quantity not heing very large. As said, the device did not work so well here, because we bad no drier as I thought, and I reversed the arrangement by putting the fine screens in the sides of the mortar as usual, and making the apron of coarse gauze, about 10 meshes to the running inch. This last arrangement does not increase the stamp duty, as the first does, hut it has a good effect in preventing very coarse material from falling into aud breaking the screen conveyer, in case of the rupture of a screen in the battery —also when, for any reason, it becomes necessary to clean out the mortar, it enables the workman to that quickly, as he has hut to draw the ore out on to, and over the apron, the portion whicb can pass through not heing ahle to do any harm.

Iu either way the invention is quite old, and unless there is some new feature uot manifest from your description, the fact that it could be patented at this late day illustrates a necessity, long since pointed out, for a change in our patent system. C. H. CLARON.

Nogales, Oct. 8, 1884.

Mines of Esmeralda Co., Nevada.

[From our Traveling Correspondent.]

This couuty ahouuds in minerals of almost every description. Iu addition to numerous and productive mines of gold andsilver, copper, lead, zinc, antimouy aud other metals are everywhere met with, principally in combination with silver ores, not to mention her vast deposits of salt, soda, alum, horax aud similar minerals, much of which are already flowing through our channels of commerce, adding to the wealth and admiuistering to the wants of the State aud of the coast.

Hawthorne, the New County Seat,

Upwards of 100 miles from Carson City, on the line of the Carson & Colorado R. R., is beautifully located in full view of the southern part of Walker lake. It is the principal shipping point for the Bodie, Clinton, Sundy and other mines of Mono county, Cal., as well as for Aurora, Coryville, Garfield, Alum Creek, Cat Creek and Kinkead districts, all uew and promising miniug camps of the county and situated from 8 to 20 miles from Hawthorne, with the exception of

Aurora, the Former County Seat

Which is distant about 30 miles. This is an old and once flourishing camp—Rip Van Winkle-like, just waking out of sleep, or like the fabled bird of old, beginning to revive again from her ashes.

While here I visited the Humboldt and Silver Lining mines. They are both situated on the same lode, which runs through tbe center of Humboldt Hill, about one-half mile north of this old town.

The ledge crops out in places at least 25 feet above the surface of the hill. It was a matter of no little surprise to find that a ledge of such a character and size had so long remained unnoticed and undeveloped. But a company has now gone to work in earnest under the supervision of ex-Gov. Blasdell, who is represented to hold a large share of tbe stock.

The ore is worked at the mill of the Humboldt Mining Co. of 20 stamps, situated at Del Monte, on Bodie creek, and some of it at a custom mill of 10 stamps near the mine.

It pays from $15 to $35 per ton, and is worth from $7 to $9 per ounce. The lode betweeu walls is over 30 feet in width. It is free milling and easily mined, and should make its lucky owners a mint of money if properly worked. It will probably take anotber year to open up the miue in good shape, heing down now 70 feet on the Silver Liniug and 100 on the Humholdt, with no other power except tbe windlass. It seems to me that with suitable hoisting works and all suitable facilities which will be added in time, the ore, mostly gold, could be mined and milled for less than $10 per ton, leaving a large margin for profit and room for the employment of 300 men or more, instead of 40, as at present.

The New and Old Esmeralda and Other Claims.

The New Esmeralda is located two miles north of the Humboldt Hill. It is said to be a very large ledge, the ore similar in value and character to the above, and each resembling the Standard rock at Bodie. One hundred tons milled at the rate of about $30 per ton. Some experienced miners who have lately taken a contract on the mine, it is understood, are calculating on getting sometbing like $40 per ton from the rock.

The Old Esmeralda, tbe original discovery in the district, from which tbe county took its name, is said to he an immense vein that has paid from $100 to $300 per ton. Arrangements are being made to put up a large mill. Tbe Prospectus, south of the Humboldt, is very highly spoken of, giving large assays, as well as four or five other mines in the district.

Mr. E. Drake, of the St. Lewis, was not interviewed, hut is quietly working away keeping his own counsels and believed to he doing well. From what has appeared, it must be evident that Aurora is agaiu coming to the front, and will, it is hoped, soou more than rival its palmiest days and yield its millions to the revenues of the country.

Mount Cory District

Lays claim to several valuable mines, or to say the least, excellent prospects, among which may he mentioned the Yellow Jacket, Big Indian, Enterprise, Rising Sun, North Star, Silver Brick and several others, all of which have been prospected more or less, some of them giving very promising results from rich assays or from working tests.

Attention is called first and foremost to the

Plant of the Mount Cory Mill and Mining Company

As the leading claim of this section, being hy all odds more fully developed aud apparently on a very substantial basis financially. The mine is opened by tunnels on differeut levels, hy a shaft 100 feet from the lowest level, and 400 feet of drifts, having attained a depth of 500 feet. Tbe lode varies in width from 30 to 60 feet, with ore chimneys from 1 to 6 feet in width.

The character of the ore is silver-bearing, combined with zinc hlende, fahlore, galena, pyrites of copper and iron, making it somewhat difficult to work. The company have shipped some $300,000 from tbe mine, and are now extracting daily about 60 tons, which works up to $60 per ton in silver at the company's very large and substantial mill, situated eight miles from Coryville, the location of the mine, and four miles from Hawtborne. No attempt will be made to go into a detailed description of the mill and the process of the reduction of this difficult ore to manipulate. It is sufficient to say that three sets of Kronis steel walls are in use, with a crushing capacity per day of 72 tons; four revolving furnaces, in the form of a frustrum of a cone, the invention of Albert Anent, tbe superintendent, said to give the best results in crushing and chloridizing; also 24 leaching vats, and all the necessary appurtenances for complete working by lixiviation.

The mode of extracting the silver is by the Patera process, heing effected by meaus of hyposulpbite of soda in aqueous solution, precipitated by polosulphide of calcium. I have taken the liberty to condense from the Walker Lake *Bulletin* this description of mill.

The North Star Con.,

The property of John Crossman and the Geming Bros., consists of the Young America, Francis, Rover and North Star, the main work heing done on the last named. It has been opened on the lode to the depth of 100 feet, showing at that level 7 feet in width of pay ore, estimated by assays to mill as high as $50 per ton. Some assays have reached $750. Silver Brick ore is represented as assaying from $280 to $300, near surface, one or two assays reaching $2,000 per ton.

Smith & Martin, of the Yellow Jacket, showed me a $25 gold nugget at Hawthorne just taken out of their mine in the neighborhood. They cleared up $80 from 1,800 lbs. of rock by arastra process, and inform me that they have had assays as high as $5,000.

Mines of Alum Creek District.

Tbe Excelsior is down 80 feet. Lode varies from 2 inches to 10 feet. The ore is said to be in the maiu a very high grade free chloride, yielding from $30 to $2,000 per ton—notes do not say whether hy assays or working process. The rock of the Williams mine and of the Nut Pine is represented to be of a similar character. That of the Millsaps and Carrigan is argentiferous galena. The Farrington copper mine, in this district, has reached a deptb of 100 feet, the ore running from 12 to 16 per cent copper.

The Esmeralda Co.'s Claims

In Cat Creek district consist of a group of about 12 in all, said to have fine water privileges and a mill the number of stamps not given. They are at present, as represented by one of the principal owners, runningon gold ore that yields as high as $60 per ton.

In Kiukead district all claims are understood to he coutrolled hy Mr. J. Moss, who is about to erect a ten-stamp mill, the lodes are said to contain rich ore of free gold varying in width from four to eight feet.

The Garfield District.

Tbe Farrington group, consisting of the Lancashire, Atherton, Great Western and others, has reached a depth of over 600 feet, said to show strong veins all the way down, the ore to average $225 per ton and to bave not less than $1,000,000, in sight. The mine is owned hy Farrington Bros. and their five-stamp mill just completed is reported as one of the fiuest (taken in all its departments) ever put up in the State. Steady work with excellent prospects is going on in the Handley claims adjoining. The Blue Light is working 6 men taking out copper ore that is said to average 17 per cent at the smelter (Soda Springs). Other mines have produced well here. It is understood that the Garfield though not now runniug has yielded $100,000 in hullion.

Gillis and Santa Fe Districts,

On the east of the C. and C. R. R., and not far from Luoriug, must receive some notice hefore I close.

Santa Fe district is somewhat celebrated for its large copper ledges of low grade ore from 10 to 12 per cent copper. It is said, however, that a large amount of high grade has been shipped, running from 25 to 30 per cent, some reports going as high even as 50 per cent.

The Tip Top is a silver lode, carrying lead and copper. It has a 300-foot shaft on tbe lode showing a width of from two and a half to seven feet. A car load shipped to San Francisco, as a test, yielded $55 silver, no account heing taken of the copper and lead. The Sun Rise, a mile from this, is said to furnish ore of a higher grade. In Gillis district, from five to six companies are reported at work, some of them making shipments; there are no mills here and no furnaces.

The Hidden Treasure, the property of Mr. L. Smith, of Belleville, has reached a depth of 225 feet and run three drifts of 100 feet each. The vein is narrow but very rich, the ore sampling $500 per ton, first class, netting after deducting for expense of sbipping and working $375, second class $100 per ton. This little mine has up to this time produced $20,000 and what is better than can be said of the great majority of mines, it has been wholly self-sustaining.

A. C. K.

Vanadinite.

Mr. Francis Hayes Blake, gives the following description of the mineral of Vanadinite, in Pinal county, Arizona:

Tbe rare mineral Vanadinite is found in tbe "Black Prince mine," Pioneer mining district, Pinal county, Arizona, in brilliant red and yellow hexagonal crystals. Qualitative tests show the presence or vanadium, chlorine and lead.

The crystals occur in tbe seams of a partly decomposed rock resembling trap, covering completely in some cases five square inches of surface. They vary in size from one sixty-fourth to one-eighth of an inch in diameter, sometimes reaching the length of one-quarter of an inch. They are often implanted by the side, and are then doubly termiuated. The majority of these crystals are of a deep red color; some vary from a red at one end through deepening shades of delicate straw-yellow to orange and red at the other end. Others exhibit a succession of layers of deep red aud light yellow parallel to the hasal plane. Many of the crystals are cavernous, and fibrous, resembling in their cavernous structure the prisms of pyromorphite. The prismatic planes *I* are striated vertically, which in this respect is just the opposite to what occurs in pyromorphite.

Tbe simple hexagonal prism, without modifications, predominates as the crystalline form; although in some groups of crystals is found the combination of the two prisms *I* and *i*-2, with the hasal edges replaced by planes of the pyramid of the first series. These planes are very minute. I was unable to find planes between *O* and *i*-2.

Wulfenite is also found in this miue, hut not in very perfect crystals.

A NEW PROCESS.—Gen. J. E. Condict, manager of the Pacific Coast Electrical Construction Company, is on his way to tbe Philadelphia Electrical Exhibition. Mr. Condict has made many experiments in desulphurizing ores by electricity, and will make that the subject of special study while East. It is quite within tbe possibilities that works of that nature will he put up in Reno within a few years, or possibly within a few months. He thinks this would be the best location on the Coast for such a process.—*Eureka Sentinel.*

Crystallized Gold in Prismatic Forms.

Near Clancey, on Clancey creek, Jefferson county, Montana, minute crystals of gold occur which present the novelty of a solid octahedral nucleus, or head, witb a long, divergent brusb-like or prismatic development of the gold on one side, or angle, giving the whole the appearance of the drawings usually made to represent comets. The total lengtb of these crystals does not exceed from two to three millimeters (about one eighth of an inch), and the minuteness of the cross-section of the delicate divergent prisms makes it extremely difficult to determine their form. Tbey are, also, very brittle, and they appear to cleave or break asunder in planes at right angles to their lengtb. Under the microscope these prisms are seen to have three or more planes and they appear to be hexagonal. They taper gradually and uniformly to a sharp point, and are sometimes composite, heing for part of their length formed of two or more prisms joined side to side.

Among the fragments, one, larger and broader than the others, exhibits a solid octahedral nucleus with a flat or plate-like projection on opposite sides. This projection shows distinctly on one side a line of composition through the ceuter, with divergent lines or markings at an angle of 45° with the medial line, corresponding in angle and in direction with small planes on the edges. The same side of this plate which shows the medial line of composition is slightly trough-shaped, heing formed of two plane surfaces inclined towards the medial line. The opposite side is rough, with angular projections.

These plate-like projections from the octahedron are much larger than the prisms, but it is probable that the origin and crystallization of both are similar. Tbe plates have the appearance of being formed hy the combination or twinning of octahedrous parallel with their faces, with their main axis inclined towards each other at an angle of 60°.

Hexagonal Prisms of Gold.

At Sonora, in Tuolumne county, California, I obtained some years ago from the late Dr. Snell a sample of very small but brilliant prisms of gold. Under the microscope these are seen to be hexagonal prisms with smooth and brilliant planes and terminated at one or both ends with a pyramid. They appear to be well formed crystals without marks of compositiou or twinning. The basal plane is also visible. The angle between the prism (*I*) and the pyramid (1) is approximately 130°, by measurement kindly made for me by Prof. E. S. Dana. Tbey resemble the prismatic gold crystals figured by Prof. A. H. Chester, and obtained artificially by digesting gold amalgam in nitric acid. It is possible that tbe Sonora crystals are also artificial, but there is no means of verifying their origin. Similar crystals obtained at Angels Camp, in tbe same region, were said to have been taken from a cavity in quartz.

The crystals described hy Prof. Chester contained six per cent of mercury. Le Sage, a writer of the last century, 1777, also mentions prismatic crystals of gold obtained hy heating the amalgam. He describes them as square prisms with terminal pyramids of four planes, and considered tbem to be lengthened octahedrons.—*Prof. W. P. Blake, in American Journal of Science.*

SHASTA COUNTY MINES.—The Shasta *Courier* says: In a recent issue we spoke of the vast amount of sulphurets encountered in many of the large ledges in this county, and said that wben the right processes were discovered and applied to the working of tbese ores, old Shasta would forge to the front as the hoss mining county of the State. And, almost as we wrote, the elucidating geni was at hand. Mr. Palmer, of the renowned Denver, Colorado, Reduction Works, has been here for several weeks examining various mines and taking samples from the same, from which he will make careful working tests. In case the tests are favorable (and they are sure to he so), a smelting branch of the Denver establishment will he erected in this county at some point most accessihle to the principal mines. Mr. Palmer has spent about a week at Iron mountain, and we understand that he is astonished and delighted at the vast mineral resources of that wonderful ore body. There is light ahead for the ledge-owners of Shasta county, and the chances are that they may yet be ahle to rejoice in their day and generation.

A UNIQUE FORMATION FOR A MINE.— Iu formation, the Colorado Central, one of the big mines of Georgetown, Colorado, stands alone. The Georgetown *Courier* thus describes its peculiarities: A singular phenomenou of this mine is tbe veiu of obsidian, or volcanic glass, found between the north mineral and wall. The north wall of the mine is porphyry. Next to the porphyry is a thin selvage of grayish material, which is quite solid when taken out, but rapidly becomes friable and clay-like wben exposed to the atmosphere. Next to this is a vein of obsidian, varying in thickness from a thin seam to ten feet, and averaging about thirty inches. This has been fouud to be continuous for 2,000 feet in length in the workings, and crops out at tho surface 2,500 feet west, wbere it crosses to the north side of the dyke of porphyry. Another selvage of clay-like material lies between the obsidian and mineral vein.

MECHANICAL PROGRESS.

Home-Made Emery Wheels.

The solid emery wheels have made possible a wonderful advance in the surfacing and polishing of metals in the shop, in truing centers, sharpening tools, and in other processes. Yet in some cases, they are not equal to the home-made wheel for one reason—they become smaller by using, like the grindstone; and there are jobs where it is very desirable that the emery wheel should retain its original and uniform size. It is well, therefore, to give a few words of this almost forgotten shop lore.

The emery wheel should be of soft wood pine is to be preferred—made of alternate layers of boards planed to make good joints, put together with glue and screws, the grain crossing each alternate layer of boards, which should be not more than three-quarters of an inch thick; half inch boards are better. Make the wheel slightly thicker than it is to be when finished, as it is to be turned and trued on the sides as well as the face. With a band saw or gig saw, shape the glued-up and screwed boards to a circle, chuck it in a lathe, and bore and turn a hole and recess at the center to receive a disk, or gland, of iron that has been bored and faced up, having screw holes in its flange. The hub of the gland should be seated in the wooden wheel. When the gland is in place and secured, the wheel is ready to be turned to finish. It is mounted on an arbor for this purpose. Some wheels are to run on a threaded arbor, and the gland is therefore threaded.

After turning to size, peg a belt or band of wet belt leather with shoe pegs to cover the rim of the wheel, flesh side of the belt outside. This makes a hard wheel. If one with a yielding surface is desired, peg on layers of Canton (cotton) flannel to the requisite thickness, carrying them over the edges of the face to make a round edge. Cover the whole, not with leather, but with strong denim or bed ticking, pegging or tacking it on the sides of the wheel. This makes a soft or stuffed wheel, which is for polishing—not grinding—and it will do work of a somewhat irregular form.

Brush the face of the wheel with hot glue, pass a round bar through the center, and roll the wheel in emery that is spread in a shallow trough or on a clean table. Any particles of iron or steel filings in your emery will make trouble; have the table or trough perfectly clean. One coating of glue and emery is better than more, for when the outer coating is worn off the glue will glaze. Do not rap off any of the loose particles of emery until the wheel is perfectly dry; the reason is obvious—the undried glue will not hold the particles in place.

When the wheel has been worn, the glue and emery is to be removed by soaking in water, and the facing repeated. If the use of these wheels is sufficient to warrant the trouble, it is well to have a trough of water in which two iron rolls revolve by power, the faces of the rolls far enough apart to allow an emery wheel to ride and roll between them, the shafts of the rolls to be connected at one end by gear wheels and an intermediate, so that they both turn in the same direction, and the emery wheel standing on its face will be slowly revolved by their combined action, the water in the trough being at a sufficient hight to just wet the face of the wheel as it turns. This method prevents the whole wheel from being wet and warped. If this method is not feasible, repeated hand washings of the face must be made to soften the glue.—*Scientific American.*

Tempering Steel by Compression.

M. Clemandot's method consists in heating the metal so that it becomes sufficiently ductile, and then submitting it during cooling to a strong pressure. He noticed that this treatment affected the structure of the metal in such a way that it acquired properties analogous to those brought out by tempering. The metal thus obtained differs considerably from steel simply cooled, by its finer grain, its greater hardness, and its greater resistance to rupture, particularly with grades of pretty high carbon steel. In these respects it approaches in quality steel tempered in water, without being identical with it. It has two different effects, almost simultaneously—an energetic and continuous compression, and a rapid cooling of the steel. The cooling is caused by the contact with the platform of the hydraulic press, and takes place much more rapidly than when the same piece is allowed to cool without being compressed. The remarkable results obtained by M. Clemandot are explained by the combined action of cooling and compression. The first, in its results, resembles the compression effected by hammering or rolling; the second the effect of tempering by immersion. It has been urged that the piece of steel must be inclosed by a mold into which it fits exactly. It is, however, only necessary that the compression act upon two opposite faces. A square bar, whether straight or curved to horseshoe shape, need only be laid down flat and compressed between the two platforms of a hydraulic press. In order to obtain the best results, the cherry-hot piece of steel should be as rapidly as possible subjected to the pressure settled upon beforehand, ranging from 10 to 30 kilogrammes per square millimeter.

While the tempering process by immersion brings about an increase in the volume of the steel and a corresponding decrease in its density, the action of high mechanical pressure during the entire process of cooling tends to bring the metal back to its original volume or its normal density, thus preventing the creation of a state of intermolecular tension noted in tempered steel. Actual experiment has confirmed these theoretical deductions, so far as the resistance of the compressed steel to stress is concerned.

American vs. Russian Sheet Iron.

American planished sheet iron is now made fully equal if not superior to the best Russian iron. A Pittsburg firm, W. D. Wood & Co., have labored assiduously for 30 years to perfect this description of iron. They have now attained such a degree of success in its manufacture that some workers in that metal pronounce it quite superior to the Russian make. It is said to be more evenly rolled, equally soft and ductile, more highly polished, or "glanced," as it is technically called; equally as durable to weather, exposure, etc. It is also made of different widths, which gives it the advantage of being worked up more economically, while Russia iron is always made of a given length and width, and probably always will be.

It is no longer necessary to go to Russia for this indispensable material. We can now obtain it from our own shops, and it is said that since the more recent improvements in its manufacture have become generally known the importation of the foreign article has fallen off fully one half. Indeed it is stated that the consumption of American planished iron is now more than double that of the imported article. We have in this manufacture another evidence of the mechanical progress which our people are making.

STEEL OR IRON.—The questions, What is steel? and, What is iron? which have led to such memorable discussions in this country, are now troubling French iron-masters, and, to a much less extent, the French customs officials. The duty on steel is higher than that on iron, and it has been the practice of the French custom-houses to look upon the property of steel that it hardens when quenched in water as its distinctive characteristic. Everything went on well until what we term in this country "soft steel" was put on the markets of the world in large quantities. French importers seized the idea of calling this metal "fer fondu," translating the German word "Flussesisen," and took advantage of the fact that it will not harden to claim that it was iron, and not steel, and as such should be admitted under the lower duty. The French iron-masters protested vigorously, and in consequence of their objections the Minister of Commerce submitted the question whether the metal in question was iron or steel to the Comite Consultatif des Arts et Manufactures, who detailed Professor Lan, a very widely known metallurgist, to study the question. M. Lan reported that it was steel, even if it did not harden; but still the customs officials insisted on their classification, and the hardening test as its basis. Thus, for the present, in France, soft steel is iron.—*Engineering and Mining Journal.*

TEMPERING.—In tempering steel, water mixed with ice gives the very superior results. One may even insert some small tools to advantage in a lump of ice, as jewelers and watchmakers do when they temper them in sealing wax. Often oil is used and is preferable to water because it is easily evaporated. Damascened blades, it is well known, are tempered in a strong current of cold air passing through a narrow chink, a temper more uniform than with water being thus obtained. But of all means for this purpose it is believed the most efficacious is metallic liquid, and mercury being the only one known, and always a good conductor of heat, as well as the best of liquid conductors, it has come to be regarded as an unequalled bath for tho tempering of very sharp steel tools. A very sharp steel, to which in forging it a convenient form was given and which was afterward tempered in mercury, might be equal, it would seem, to cutting through almost any substance.

THE GJERS SOAKING PIT is gradually coming into use both in this country and in Europe. It effects a great saving of fuel, by enabling the double process of carting and rolling to be made by one heat. It is now in continuous operation in four Bessemer works in England, two of which roll off directly without any furnacing whatever; and it is to be started at the largest open-hearth steel works in Scotland. On the continent two Bessemer works are using the soaking pit, a third one is just starting, and one open-hearth plant is also employing it.

AMERICAN EDGE TOOLS.—The reputation that once gave Birmingham the control of the edge-tool market of the world is slowly but surely settling down upon our own makers, and why not? Better wages bring to our shores the best and most brawny mechanics of the Old World, and protection insures profits that justify ample expenditures on machinery, buildings, etc.

TEMPERING BRASS WIRE.—Brass wire as used for spiral, and various other springs is tempered by drawing, without annealing; this is what is called "hard drawing."

SCIENTIFIC PROGRESS.

Electric Properties of Flames.

In Wiedemann's *Annalen*, Herr J. Collert describes the results of investigations on this subject, of which the following abstract appears in the Chemical Society's *Journal* for June: "This investigation is a continuation of Hankel's researches on the electrical properties of the Bunsen and alcohol flames. The method of experiment was as follows: A spiral of platinum was placed in the flame symmetrically with its axis, and connected with one pole of a Hankel electrometer, the other pole being in connection with the burner; the electrometer was also connected by a commutator with the poles of a zinc-copper pile conducting to earth. The principal results of the investigation are as follows: "1. The difference of potential is dependent on the material and the temperature of the mouth of the burner; an electro-potential series of the materials of which the burners are constructed can be arranged, of which iron is the most negative. 2. The difference of potential is also conditioned by the position of the spiral; the point at which the greatest electromotive force is produced coincides probably with that of maximum temperature. This latter result probably represents the sum of several conflicting causes: first, by the rise of temperature the platinum is positively electrified; secondly, by contact with the hydrogen and carbonic oxide gas it is negatively electrified; and thirdly, in the cooler parts of the flame it is positively electrified by contact with steam and carbonic anhydride. As regards the second of these points, the experiments of Deville tend to show that the higher the temperature the greater proportion of free hydrogen and carbonic oxide present; while Grove has shown that platinum is negatively electrified when in contact with these gases. 3. The results obtained by the author agree with those of Elster and Geitl."

PREDICTING THE WEATHER FROM THE COLOR OF THE STARS.—From the fact, determined by W. Spring, that the color of pure water in great bulk is blue, M. Ch. Moutigny explains the predominance of this color in the scintillation of the stars just before and during wet weather. The luminous rays, he argues, traversing the air charged with large quantities of pure water are necessarily tinged with the blue color of this medium. The excess of blue thus becomes an almost certain means of predicting rain. This theoretic conclusion corresponds with the results of his observations continued for several years past on the appearance of the stellar rays in connection with the state of the weather. During the few months of fine weather in the present year, blue has been much less conspicuous than in the corresponding months of previous years since 1876, when wet weather prevailed. It also appears that green, which had always coincided with clear skies during the fine years before 1876, has recently again become predominant. Hence he thinks it probable that we have got over the cycle of bad seasons, and that dry weather and more normal summers may be anticipated, at least for some time to come. The above is from *Nature*, and the same number contains an abstract of a paper by Professor C. Michie Smith, on green colored suns, in which he concludes that this phenomenon is due to the presence of unusual quantities of watery vapor in the atmosphere.

THE MICROSCOPE.—A writer on the manufacture and use of the microscope corrects one of the common errors prevalent concerning its use, namely, that the higher the power capable of being employed the more valuable the instrument, the fact being that equally satisfactory results are known to have been obtained with one of 3,000 diameters as of 100,000. The ordinary work for which a physician uses a microscope requires from 100 to 500 diameters only, while special work can be done with ease with from 2,000 to 5,000 diameters. Again, "times" and "diameters" are not synonymous, the diameter being, of course, the distance across the object, so that if an object be magnified 500 diameters, it is magnified 250,000 times, or the square of the diameter, the difference, in point of fact, between the two dimensions in measurement, being quite apparent. The degree of curvature is what makes the glass a magnifier, and the two kinds of glass used tend to correct each other's inaccuracies. The glass is cooled so gradually and stirred so constantly as to be perfectly homogeneous.

CHEMISTRY.—There is no department of modern science that receives a larger share of attention than that of chemistry. The tendency of present effort and thought is toward analysis. Everything must be subjected to the disintegrating process. If anything by common consent is pronounced good, it must be taken to pieces, that its construction may be understood, and so the better appreciated; if it does not meet with general favor, it still must be dissected, and its constituent parts subjected to the closest scrutiny. Hence, we see students in the various departments of natural science and biology resort to a careful investigation of the primary elements of matter, that they may thereby gain such information as will substantiate their theories. If, in addition to this, we consider how much the science of chemistry has benefited the world in the various departments of the useful arts, we can readily understand why so much attention is being given to it by students, and why so many new works appear on this subject.

SMALL ELECTRIC MOTOR.—The visitor at the Philadelphia Exposition finds nothing that interests him more than the little electric motors that are used for running sewing machines, lathes and household machinery. In one place a hundred girls are engaged in sewing by the aid of these motors, and they are enthusiastic in their praises. It tires them less, while they are able to do a third more work. This business has assumed great importance in the large cities. In Boston contracts have been made to place 10,000 of these little motors in use, the current being supplied from the stations by the electric dynamos. This branch of the business promises greater profit, even, than the light. In Philadelphia the Brush Company are running these motors for five cents a day each; and as the current of one arc light will supply fifteen motors, a very handsome revenue is derived from this source. There are very few householders but what would gladly rent a cheap power like this.

INTERESTING EXPERIMENT WITH MAGNETS.—A curious and instructive experiment has just been made by M. Duter, who took a number of very thin plates or disks of tempered steel, about a millimeter thick, and from five millimeters to forty centimeters wide, and built them into piles, the adjacent plates being sometimes in contact, and sometimes separated by a sheet of paper or cardboard. These piles were then inserted in a very powerful magnetic field, and withdrawn. It was then found that they had become powerful permanent magnets; but when the individual plates were separated they seemed to have lost their magnetism. On building up the pile again the original magnetism was restored to it. It appears then that the thin plates have not really lost their polarity on being withdrawn from the exciting field. Some of Professor D. E. Hughes' recent experiments have a great similarity to M. Duter's.

LIFE FROM THE DECOMPOSITION OF AUTUMN LEAVES.—According to the researches of a microscopic naturalist, who has been investigating experimentally and by observation from nature the forms of life produced by the decomposition of autumn leaves, trees have played a very important part in the elaboration of alluvial deposits and increasing the fertility of the soil. He finds three special organisms peculiar to the resolution of leafy tissue into soil. One is a large ovoid, disciform organism, of pale yellow color, and without organs of prehension or locomotion; the second, a well-developed animalcule, with double rows of tentacles at each extremity; and the third, a rod-shaped creature, also with tentacles at each end, which moves by alternate contraction and expansion. Millions of these creatures inhabit every thimbleful of forest mold, and concur in its conversion into alluvium.

TO DETECT WATER PASSING OFF FROM A BOILER WITH STEAM.—Herr Stoupler, of Luzerne, Switzerland, by adding fluorescine to the water of a boiler, which by calorimetric test enabled him to detect the presence of one-half of one per cent of water carried mechanically out of the boiler by the steam, found that from 2.3 to 4 per cent was actually thus present in the steam. The deep green color of the water in the boiler was retained in it for weeks, and yet no trace of coloring could be detected in the water condensed in the steam cylinder—a proof that the water which gathers there is entirely due to condensation caused by the expansion of steam, and that very little water is actually mechanically carried away by the steam from boilers.

PURIFICATION OF OILS.—Oils containing free fatty acids and other impurities may easily be purified, according to Viallis, by filtering through charcoal impregnated with soda. For purifying large quantities of oil, tubs with perforated bottoms are used. A layer of flannel is placed upon the perforated bottom, over this a layer of impregnated charcoal, about 20 cm. in depth, and in case the oils are to be obtained colorless, a layer of bone black is added. By placing two or three of these tubs, one below the other, and passing the oil through them successively, a perfectly pure product is obtained.—*Corps gras. ind.*

AN INTERNATIONAL SCIENTIFIC CONGRESS.—During the recent meeting of the American and British Associations a proposition was brought forward for the organization of an International Scientific Association, to meet at intervals in different countries of the civilized world. It came in the shape of a petition signed by many members of both the British and the American Associations. The matter was referred to a committee from both associations, which joint committee will confer and report hereafter. The idea meets with very general approval.

FIRES IN COLLIERIES.—M. Durand, who has been studying the reason of spontaneous combustion in collieries, attributes it to three causes—the oxidation of iron pyrites in the coal, friction from slipping and heat of air current,

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Passing Events.

The heavy rains which have been falling several days of this week in California have done more or less damage to exposed grain and to the grape crop. They will be a help to mining operations, however, giving more water where water is used for power, and starting the springs and streams. It is unfortunate, however, that the hydraulic miners can no longer utilize the water in their operations. To them a heavy rainfall meant longer water season and increased profits.

The Little Rocky mines in Montana have attracted a large number of men who are now prospecting that region.

Cabeo district, in San Bernardino county in this State, announces a rich strike of silver ore in one of its mines this week. In the last month several good developments in silver mining have been made in that district. The camp has produced some $600,000 so far this year.

A new mining region is announced this week, in British Columbia, about 80 miles from the mouth of the Skeena river. A big rush is expected in the spring. The mines are gold placers.

AN Arizona paper states that at least 20 per cent of the mining failures in Arizona may be justly charged to the disposition of Eastern companies to try new styles of reduction machinery. It is time to call a halt in this kind of business folly.

A New Metallurgical Process.

Working Auriferous and Argentiferous Arsenides and Sulphides.

In the MINING AND SCIENTIFIC PRESS of August 16th last we described a new method of separating gold and silver from arsenide of iron, the invention of Mr. Edward Probert, of Eureka, Nevada, by introducing litharge or lead into the auriferous or argentiferous arsenides and sulphides of iron or copper, while in a state of fusion. Mr. Probert has now patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, an improvement on the process, namely: Stirring the material under treatment by means of an elastic vapor or vapors, generated by the action of the molten mass upon a mineral substance or substances within the pot or receptacle in which the material is being heated, and without the aid of any mechanical stirring by hand.

The success of Mr. Probert's method of treatment by the introduction of litharge or lead into the molten mass depends largely on the thorough and intimate blending and admixture of the lead with the arsenides, sulphides or reguline metals under treatment. The stirring by hand is a tedious, and at best an imperfect, means of effecting the object in view, and in some cases an impossible one, as in that of the arseuides of iron, from the corrosive nature of the substances themselves, which rapidly destroy all implements of iron or steel introduced into them for the purpose of stirring. Mr. Probert's new invention is a method by which the mechanical stirring is rendered altogether unnecessary, and a much more complete blending or mixing of the material is effected.

The method of proceeding is as follows: Iron pots, of a conical shape, about 30 inches deep, 30 inches wide at top, and rounded off at the bottom spherically to about 12 inches in diameter, each capable of holding 1,500 weight (more or less) of the substance to be treated, are coated with a lining of refractory material, composed, preferably, of decomposed or pulverized lava, pumice, or other volcanic rock, but when this is not obtainable, of silicious sand, with a certain admixture of finely pulverized limestone or calcareous marl, to which has been added a sufficiency of clayed water or milk of lime to work the whole into a paste. After laying on this internal coat of refractory material (intended primarily to protect the pot from corrosive action) to the thickness of about three-quarters of an inch, a further portion of a specially prepared composition, consisting of coarsely crushed limestone, dolomite, siderite, or other suitable carbonate, mixed with a sufficient quantity of the ordinary composition with which the pot is lined to give it consistency, is laid on the bottom of the pot to the thickness of one inch, more or less.

The pots thus prepared are placed in a suitable oven or chamber, or a small fire is placed inside each pot, to dry the coating, which, however, is not to be baked so as to expel the last portion of moisture, but only so far as to remove the excess of water. When required for use, the pots thus lined and partially dried are placed in succession under the spout of the smelting furnace containing the substance to be treated in a state of fusion, which is then tapped into them, while at the same time, or immediately afterward, a charge of lead or litharge, preferable granulated, is fed into each pot from a hopper conveniently placed above.

The first effect of the molten substance tapped from the furnace into the pots, is to convert the small amount of moisture contained in the protective lining of the pots into steam, which, rising upward from the bottom and sides, causes a brisk ebullition of the molten material. This treatment is insufficient in itself to effect the thorough stirring and blending of the contents of the pot necessary to assure a successful result; but no sooner is this first ebullition, due to the escaping steam, over, than the limestone, dolomite, or other carbonate fixed in the bottom of the pot, as well as the calcareous matter in the whole lining, begins, under the intense heat of the molten charge, to undergo calcination, and streams of carbon dioxide are sent off, which, rising upward through the molten matter, produce the effect of a small geyser. This keeps the charge in a state of ebullition and agitation for a period of time proportionate to the quantity of mineral carbonate, or other source of carbon dioxide, originally used in preparing the pot, and thus effecting such a complete blending and intimate admixture of the ingredients as cannot be attained in any other way.

The duration of the ebullition, and, consequently, the stirring process, may be regulated to any required number of minutes, from five upward, or as long as the molten material continues hot enough to exercise a calcining effect on the limestone, etc., and inasmuch as the carbon dioxide produced comes off in a steady stream without sudden bursts, as from the vapor of water, there is never any danger to the workmen from explosions. After ebullition is over, the pot with its contents is set aside to cool, when the lead settles to the bottom, carrying down with it the precious metals, and, when solidified, the mass of alloy can be detached from the waste matter and treated by cupellation in the usual way for the separation of the silver and gold. It will thus be seen that the stirring is effected partly by steam, which, however, can never be made to do the whole work, being too violent in its action, and causing trouble when too much moisture has been left in the composition, but chiefly by the carbon dioxide ("carbonic acid," so-called,) developed during the calcination of the limestone or other carbonate employed as the source of gas or vapor.

Although this description has referred only to the mineral lining of the pot and to the mineral substance attached to and practically forming a part of the lining as generating the elastic vapor or vapors, Mr. Probert does not strictly confine himself to this method, for in the treatment of a number of substances it would be practicable to hold down, introduce or support in some other manner within the mass the suitable mineral substance or substances to effect a similar result as that which is described.

Mr. Probert is aware, of course, that in the operation of "poling," in the working of copper and lead, a piece of green wood is thrust into the molten mass to agitate the material, and also aware that in the Bessemer steel process air is forced into the material, and in the process of pattisonizing lead, steam is forced in; but his process here described differs from that of poling in that the elastic vapor is generated by mineral substances—a distinction highly important in many cases—as, for example, in the working of arsenide of iron, where wood cannot be used at all; and it differs from the steel and pattisonizing processes in being generated within the pot by the described action of the molten mass upon the mineral substance.

New Ore Pulverizer.

Mr. D. Virgil Goodson, of Bodie, has just patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, an improved form of ore pulverizer of that class in which heavy wheels or rollers travel over an annular track or bed, to which the ore is fed.

The frame carrying the rollers is given a rotary motion in a horizontal plane, and the double sets of rollers are caused to travel around on the annular beds. Ore is supplied to a series of hoppers and chutes as they pass under the discharge spouts of the main supply hopper, and each receives enough to last it one round.

The ore passes down on to trays, and by these is shaken off into the outer bed, in which it is crushed by the outside series of rollers. The partially crushed ore or pulp, as it has now become, thence passes inwardly through screens, and over an inclined surface and other screens, into the inner bed, on which it is pulverized very fine by the inner series of rollers.

In passing over the screens, that portion of the ore which has been crushed sufficiently fine drops through the screens into a trough, and is thus disposed of, while the coarser ore passes into the lower inner bed. Thence, after being crushed equally through screens into the trough on one side and over the sloping surface into the other trough, and is discharged from both troughs into receivers.

The coarser screens are intended to permit the partially crushed sand to pass freely. The rollers, being vertical, pass easily over the larger rocks without being impeded. They bear none of the weight of the frame, this office being performed by anti-friction rollers. The inner set of rollers on the inner bed—which is lower than the outer bed—are thicker than the outer set, in order, by reason of a greater surface, to pulverize the ore more thoroughly.

The New Mineral Colemanite.

Preliminary Note on the Morphological and Optical Properties of Colemanite.

At the last meeting of the California Academy of Sciences, A. Wendell Jackson, of the Museum of Mineralogy, University of California, read a paper on the new California mineral—Colemanite—of which the following is a synopsis:

On Feb. 4th, 1884, Mr. J. T. Evans read a short paper on a new "borocalcite," to which the name "Colemanite" had already been given by those commercially interested in the substance. Mr. Evans' chemical analysis led to the formula:

$$Ca^2\ B^6\ O^{11} + 5aq.$$

This borate differs from Pandermite only in containing two more molecules of water.

The peculiar interest attaching to Colemanite comes, however, from the fact that it is the first of the "borocalcites" that has been found crystallized. Mr. Evans assumed, from the general habit of the crystals, their monoclinic character, and measured with a contact goniometer the angles:

(001): (100)=70½°
(110): (110)=108½°

Four weeks ago Mr. Evans had the kindness to send me two of his crystals for further study. Recently I obtained from the owners of the deposit about twenty more crystals, so that I am now in possession of a sufficient amount of material to make a careful study of the morphology and the optical constants of the substance.

I make, to-day, merely a preliminary statement of the results thus far obtained, and reserve, for a paper to be published shortly, the fuller discussion.

The crystal which I have measured is a short columnar form (5x5x6 m. m), perfectly colorless, with brilliant faces giving, in the main, excellent reflections. Mr. Evans' assumption as to its monoclinic character, is confirmed by the examination in parallel polarized light. The crystal extinguishes parallel to the chief axis when viewed through the orthopinacoids, and at an angle of 6° 35' (to the rear) when viewed through the clinopinacoids. The plane of the optical axes is normal to the plane of symmetry, lying in the obtuse angle of the morphological axes, at an angle of 83° 25' with the chief axis. The angle of the optical axes is very large, and whether the orthodiagonal or the line at right angles thereto is the bisectrix, I have not yet determined, as the foci of the ellipses in converging polarized light are not visible in the cleavage laminae parallel to the clinopinacoid.

The axis ratio is:

$$\dot{a} : \bar{b} : c = 0.77484 : 1 : 1.08199.$$

The angle C=69° 50' 45."

The angles of the observed forms, calculated with this ratio and value of C, agree very closely with the measured angles.

I have already observed and measured thirty-four forms on the crystals. The forms thus far determined are the three pinacoids; the primitive, three clino—and one ortho-prism; three clinodomes, five positive, and two negative hemidomes; ten positive and six negative hemipyramids.

The crystals have perfect cleavage parallel to the clinopinacoid, and distinct cleavage parallel to the base. Hardness, according to Mr. Evans, from 3.5 to 4.25. Density 2.428 (Evans).

Analysis gives according to Mr. Evans:

$B^2\ O^3$	[50.98]
$Ca\ O$	27.18
$H^2\ O$	21.84
	100.00

The mineral occurs in the southern end of Death Valley, Inyo Co., Cal., in an alluvial deposit, in company with pandermite and quartz.

BETWEEN midnight and morning Wednesday of last week, some miscreant attempted to blow up the cabin of C. H. Young, superintendent of the Empire mine, on Empire creek, Siskiyou county, with giant powder. Fortunately Mr. Young was awakened by the smell of the burning fuse, and had got outside when the explosion occured which wrecked the cabin.

DURING the week ending the 11th the following shipments were made out of Utah Territory: Forty-two cars bullion, 983,531 pounds; three cars of lead, 85,195 pounds, and thirty-four cars of ore, 1,048,420 pounds. Total, seventy-nine cars, 2,177,146 pounds.

The World's Fair Buildings at New Orleans.

The grand World's fair will open in New Orleans on December 1, 1884 and continue during the winter. We give on this page views of the leading buildings which are now rapidly approaching completion.

The main building is the largest ever erected. It is 1,378 feet long by 905 feet wide, without courts, and has a continuous roof composed largely of glass so arranged as to afford an abundance of light without subjecting the interior to the direct rays of the sun. Within, the view is unobstructed. From one side or corner of the building to its opposite, the interior showing all the phases of industrial activity is seen. There are no partitions, and the lofty pillars, wide apart, supporting the roof structure, present no impediment to one's vision, but only serve to assist the eye in measuring the vast expanse. The interior is surrounded by wide and spacious galleries, twenty-three feet high, which are reached by twenty elevators having the most approved safety appliances, and by convenient stairways. The machinery department occupies a space of 1,378 feet long by 300 feet wide, within the main building, and has an extension added in iron 350 feet long and 150 feet wide for heavy machinery, described under the heading of factories and mills. From the galleries overlooking more than two miles of shafting can be seen driving every known character of machinery. Music hall, with a seating capacity, in commodious chairs, for 11,000 people, a platform capacity for 600 musicians and a mammoth organ built to order for the exposition occupies the center of the interior. The main building will contain general exhibits. It is situated about in the center of the grounds.

The building erected by the United States and to be devoted to the U. S. and several State exhibits is 885 feet long by 565 feet wide. It is one of the largest exposition buildings ever erected. At the time of the adoption of the plans it was supposed that the main building, having the largest capacity of any building heretofore erected, in conjunction with the horticultural hall and such minor outside buildings as were necessary, would afford ample space and accommodation for all exhibits; but the interest in the World's Exposition had become so widespread, and the inquiries and applications for space became so numerous, that the necessity for additional accommodations became imperative, and the management determined upon the erection of this magnificent structure specially for the United States and State exhibits. The Government exhibition will be complete—of itself, almost a mammoth exposition. Each department will have its distinctive exhibit. The department of State showing samples of cotton, wool and cosmos fibers, and of the fabrics made from them from all parts of the world. This exhibit will be arranged in continental groups representing the geographical divisions of the world's commerce, etc. The post-office department will exhibit all the improvements in mail facilities, and establish a branch office in the building for the accommodation of visitors, and to show the practical workings of the postal system. The treasury department will exhibit coast survey, light-housing, life-saving service, customs, internal revenue, engraving, printing, etc. The war department will show arms, ordinance, engineering, medical, surgical and hospital services, progress in same, etc. The navy department will show naval arms, ordinance, projectiles, torpedoes, dynamo-electro machines for firing, models of war vessels—ancient and modern, etc. The interior department—everything pertaining to the inventions and improvements in American industries and to the history, customs and habits of the aboriginal races, etc. The United States Fishery Commission, the Department of Justice, Bureau of Agriculture, the Bureau of Education, and especially the Smithsonian Institute, will be exhaustively represented. The Government exhibit will vastly exceed that made at Philadelphia. In addition to the Government exhibits, the collective State exhibits and the general educational display will be located in this building. This structure presents a very attractive appearance.

The Horticultural Hall is 600 feet in length and 194 feet wide through its center. It is the largest conservatory in the world. It is substantially built as a durable structure, becoming, by arrangement with the city, a permanent feature of the Park. It is located on high ground in the midst of live-oak groves. Surmounting the center is a magnificent tower, 90 feet high, roofed with glass. Beneath this tower, in constant play, is a grand fountain. 20,000 plates of fruit, double the amount ever before displayed at any exposition, will be shown on tables extending through the hall. Around the hall will be arranged an infinite variety of rare tropical and semi-tropical plants, flowers and shrubbery. There is a tropical hothouse, 250 feet long by 25 feet wide, in which the most delicate flowers from the far South will be nurtured and made to bloom in their most brilliant perfection. Tropical fruits in the various stages of growth will be exhibited. Fruits of every section and the productions of all seasons will, by arrangements for stated supplies and thorough processes of cold storage, be available for exhibit.

The art gallery is 250 feet long by 100 wide. It is a structure built of iron. The building is an elegant and artistic structure, so arranged for mounting, accessibility and light as to present the best effects, and with ample accommodation for as large a collection as was ever exhibited on this hemisphere.

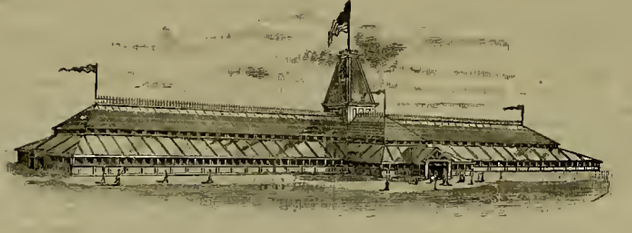
The building devoted to the large machines, or combinations of machinery for accomplishing certain kinds of industrial production is styled "Factories and Mills." It is a large iron building 350 feet long by 120 feet wide. In it will be exhibited cotton in all stages of manipulation from the boll to the bale. The newly invented "Cotton Pickers, Openers and Lappers," as well as the various and complex machinery for ginning, cleaning, baling and compressing, will be in constant operation. The supply of field cotton for this purpose will be abundant. In addition to cotton machinery this extension of Machinery Hall will contain the various kinds of machinery used in the rolling of cane and manufacture of sugar, and in the harvesting and milling of rice. Various kinds of factory and mill machinery for wood working, brick and tile making, etc., will be located in this structure. Adjacent to this building there will be a line of sawmills, extending toward the river, showing forty sawmills in motion.

It is expected that fully 20 other buildings than these shown herewith will be erected. One will be the Mexican building, which will cost about $200,000. The fair is expected to be the largest and most varied ever held in the United States. The grounds embrace the space of 247 acres, bounded on the north side by St. Charles Avenue, on the south by the Mississippi river. The buildings front east towards the main portion of the city. An electric railway encircles the ground.

MAIN BUILDING.

UNITED STATES AND STATE EXHIBITS.

HORTICULTURAL HALL.



ART GALLERY.

FACTORIES AND MILLS.

PRINCIPAL BUILDINGS FOR THE NEW ORLEANS WORLD'S FAIR.

Melrose and Glendale, Montana.

Melrose, in the extreme southern end of Silver Bow county, lies on the Utah and Northern R. R., some 25 miles south of Butte City, and on the east banks of Big Hole river, which separates, in part, Silver Bow and Madison counties from Beaver Head county. The Big Hole river is one of the main branches of Jefferson river, which latter, with the Madison and the Gallatin, go to form the great Missouri. Southwestern Montana supplies the source of innumerable streams, which flow down from small and large mountain canyons, fresh from melting snows, which lie on the higher peaks of the Rocky range during nearly every month of the year. We came to the Territory in the early fall, and there has not been a day in which, with the naked eye, from some elevation, we we could not see a snow-clad peak; and besides witnessing several snow storms. We write this letter when the ground out of doors is covered with a freshly fallen crust of snow.

Melrose itself is a small railway station, with a few country stores. It has an added importance from being the jumping-off place for the extensive mining and reduction works at Glendale, some three or four miles to the northwest. At present the Hecla Con. Mining Co. is the only company operating at Glendale. They have two lead smelting water-jacket furnaces located here. Farther up the canyon—seven miles—is their concentrator, and three miles beyond this is Scow City, situated at the base of a steep mountain, which describes a semi-circle about the village, and having an altitude of 10,000 feet above sea level. Located in this mountain are the company's principal mines. Wire-cable tramways extend from the ore house at the foot of the mountain to the mines, at an angle of 35 degrees, to transport the ore. The ore is an argentiferous carbonate of lead, and assays from 12 per cent lead, with 20 ounces silver, per ton, to 60 per cent lead, with 100 ounces silver, per ton. A narrow-gauge railroad, under snow-sheds, runs from the mines to the concentrator. The ore is assorted and sacked, the high-grade going direct to the smelters and the low-grade to the concentrator. The high-grade ore and the concentrates are freigbted on wagons to the smelters. The concentrator is an excellent one, of the Fort Scott system, with the exception of the Retinger tables for fine ores. These latter were rejected after thorough trial, and the company now work their finest ores on slime jigs. Under the able management of John M. Parfit, the Glendale concentrator works 100 tons in 24 hours, losing only 2 per cent of lead in the tailings, and making a product of 50 per cent lead and 90 ounces in silver to the ton. The two furnaces smelt 55 tons of ore in 24 hours. Fifty per cent of their charge is flux and fuel, consisting of slag, iron ore, lime and charcoal, with a little coke. The furnaces are connected with an excellent dust chamber, five feet in diameter, leading into the mountain 200 feet to a smokestack, which is built up a shaft and protrudes above the surface but a few feet.

The Hecla Con. Mining Co. was incorporated under the laws of Indiana, in 1877, with a capital stock of 30,000 shares, at $50 per share par value. The works have run steadily since their construction, but paid no dividends before 1881. A flourishing little town was built up by the liberal outlay of the early management, which seemed to be reaping somewhat the benefits of the production. But since that time, under the judicious management of the present General Superintendent, H. Knippenberg, Esq., the profits have been diverted to the pockets of the shareholders, and for the last three years the company have paid monthly dividends of $15,000 per month, together with a special dividend during the past year of another $15,000. In addition to these dividends, improvements have been made to the value of $150,000, including the excellent concentrator, costing $76,000, and the railway to the mines. The stock is gilt-edge, and hard to buy in the market. Hon. Thos. Hendricks, the Democratic nominee for Vice-President, is a large shareholder in the company, and one of the directors. The officers of the company not already named are: Chas. R. Kappis, Asst. Gen. Manager; John M. Parfit, Supt. Concentrator; H. Simons, Assayer for the company. These latter gentlemen, together with James Prout, we had the pleasure of meeting, and found them agreeable and pleasant, and willing to show us every courtesy.

Academy of Sciences.

At the regular meeting of the California Academy of Sciences, on Monday evening Oct. 6th, Professor Davidson presided:

Mr. G. P. Reynolds was proposed for membership. The donations to the museum were as follows: From Commander J. W. Phillips, U. S. N., fœtus of California gray whale, a very rare specimen; Dr. H. W. Harkness, five human skulls and skulls of quadrupeds, salt from the Polish salt mines and shells from the Sandwich Islands; Wm. N. Meeks, plant and seed of the Quinoa, from Peru; Dr. Stout, vertebra of baracouta, vials containing hair from the heads of pure Hawaiians; J. W. Phillips, specimen of pseudosquilla, Anaheim; Theo. Herrmann, star fish from Monterey; R. W. Simpson, sponges from Bering Sea; J. J. Gilbert, curious concretions, or rocks from Hood's canal, W. T.

Mr. Keep, the curator of conchology made a report of progress in arranging and cataloguing the specimens in his department.

Dr. Stout called attention to the Quinoa seed presented by Mr. Meeks, describing its uses in Peru where it is cultivated as a food product instead of wheat, and stating that Mr. Meeks had raised seed in this State, and is desirous of seeing it cultivated on a large scale in California, where it will be useful.

Prof. Davidson submitted by title papers on "The Phenomena of the Satellites of Jupiter," observed at the Davidson observatory in this city during 1882-3. "Occulation of Stars by the moon, 1883." "Pons Brooks comet"—observations at Davidson observatory December and January 1883-4.

He also read notes on "Partial Solar Eclipse October 18, 1884." "Volcanic Activity of Four Island, Bering Sea," and "The Comet Wolf."

A. Wendell Jackson, of the University of California, read a description of the new mineral Colemanite, a borate of lime occurring in Death Valley, Inyo Co., California. Mr. Jackson's investigations show that the crystals of this mineral are extremely complex, upwards of thirty-five crystal forms having already been discovered upon them. Rarely a mineral so rich in crystal forms is discovered. The crystal forms were illustrated and mathematically demonstrated. Two hundred angles have been measured on the crystals by means of a large reflecting goniometer of the State University. Mr. Evans, a member of the Academy, first brought attention to this mineral, of which he made an analysis some time since. It was afterwards thought, however, that it was not new, as some of it was sent to Vienna for examination but nothing was heard of it, it having been probably lost. Recently, however, Prof. Von Rath was on this coast and some of the mineral was given to him by Mr. Jackson. He wrote the other day that he was hard at work on it. Mr. Jackson, however, has completed his investigation and sent notes of the results to *Science*, besides describing his work to the Academy. Both he and Mr. Evans are young California investigators and it is a matter of congratulation that the thorough results of analysis and the scientific examination of the crystals should have been made here before they were abroad.

NEW DIGGINGS.—Frank Pickle and William Hassel returned Tuesday from a prospecting trip in the high Sierra. They have discovered an immense ledge or series of ledges about 80 miles east of Sonora, between the Middle and West Walker rivers, on the east side of the summit. The main ledge, which they named the Tuolumne, is fully 40 feet wide of gold-bearing quartz, much of it decomposed. Ten locations were made. A cut was run into the ledge sufficient to show the extent and character of the deposit. Now, all that remains to be done to prove its value is to test the quality of the ore. Messrs. Pickle and Hassel say that the facilities for working the property are unexcelled except in the matter of transportation. There is an ample supply of timber for fuel, and timbers growing right at the mines, and water power enough to run any number of stamps. If the ore comes up anyways near expectations, the discovery is a veritable bonanza. Messrs. Pickle and Hassel have brought down about 250 pounds of the rock, which they intend having thoroughly tested by working process. Sheriff McQuade, T. M. Yancy, E. A. Rodgers, Tom Leonard and E. A. Parsons are all interested in the enterprise, and are confident that they have a big thing.—*El Dorado Mountain Democrat.*

PRINTING INDUSTRY.—In London about 62,000 persons, or an average of 1 in every 64 of the population, are engaged in the printing and kindred industries. The letter press printers number 25,595 males and 631 females; lithographers, 2,353 males and 26 females; type founders, 841 males and 6 females; bookbinders, 5,639 males and 7,293 females; copper-plate printers, 288 males and 8 females; publishers and booksellers, 3,159 males and 254 females; music printers and publishers, 600 males and 73 females; map colorers, 339 males and 129 females; news agents, 1,462 males and 311 females; stationers, 5,119 males and 2,000 females; paper makers, 880 males and 542 females; envelope makers, 135 males and 1,552 females; editors and journalists, 1,485 males and 237 females; shorthand writers and reporters, 1,000 males and 10 females.

Tintic District, Utah.

From correspondence in the Salt Lake *Tribune*, we take the following notes: Silver City is practically the terminus of the railroad, and is a prominent shipping point of ores. The town is small, being the home of miners and men connected with the mining interests. The post-office and telegraph-office is managed by C. H. Blanchard, Jr., who appears to be a very useful man, as he is also a notary public.

From Silver City to Eureka it is five miles, the road circling around the mountain, making a half circle. A stage line, operated by Walter Gardner, makes trips to connect with all trains, and extends to Homansville three miles beyond Eureka.

The Mines.

Commencing at Eureka, which is central to the district, we find much activity in mining, and an excellent outlook for the future of the camp. During the past two years this place has developed much, and the chief mine, the Eureka, has become one of the great mines of the Territory. It is well equipped with machinery for present service, and more is to be added. It has a good hoisting engine, a Burleigh air compressor to operate air drills, pumps, etc. A depth of nearly 600 feet has been obtained, and what is very important, the vein grows larger and better as they descend. In the upper workings there was milling ores, while in the lower it is lead silver, just such as is most desirable for smelting. In the early history of Tintic there was great anxiety regarding the depth to which mines would pay, and it was generally believed that the veins did not go down far. The Eureka and Crismon Mammoth have shown that the ledges improve to the depth of 600 feet, and it is reasonable to expect the same favorable results as they go down. There are several good prospects in the district, which only need capital—if we may judge from the upper workings—to make good mines. The Eureka works from 150 to 275 men, and is sending out about 75 tons of ore per day, which is shipped to various points. This ore goes about 20 per cent lead, and 30 ounces silver, and is in such large bodies, and so easily mined and shipped as to make it one of the great properties of Utah. John McChrystal is superintendent, J. Q. Packard president and general manager of the company, Paul Schettler secretary and treasurer. The mine is most splendidly timbered, and operated throughout. Besides working through the 600-foot shaft, they are running a tunnel to the top of the ledge, and are in now over 400 feet. Progress in this tunnel is slow, because of the hard blue lime, but the tunnel is large, and one of the best we ever saw.

The Bullion.

The Bullion, better known as the Beck, below the Eureka, is working 52 men, and is shipping about 35 tons of ore per day. A depth of 250 feet has been obtained, and immense chambers of ore have been taken out, while on every hand there remain large bodies ready to be removed. This ore goes on an average 27 ounces silver and 16 per cent lead. Like the Eureka, there is an improvement in both quantity and quality of ore as they go down. Rich pockets have been found, which yielded ore running up into the thousands. John Beck, the owner of this property, is doing much for the district in the way of improvements and his various enterprises. Dennis Sullivan is superintendent of the mine.

The Tintic M. & M. Co.

The Tintic Mining and Milling Company are operating the Northern Spy and 400 feet of the Carrissa, making 1,900 feet of ground. This property is located in the same mountain as those described, but on the east side, and has been opened up during the past four years. Alex. Graham is the manager of this property, and, considering the time, the work has been quite extensive. The ores are part milling and part lead-silver, carrying gold in large percentages. The shaft has been sunk to 400 feet, to test the mine, and ore was found all the way down. But little drifting has been done as yet, and the most of the workings are in the upper levels. Recently a very fine strike of ore was made on one of the levels, the body of ore being very large, consisting of lead, silver, carbonates, with but little galena. The company is working twenty men in the mine, and when the mill is operated will work twenty more men.

The Iron Mines,

Located near Silver City, are operated by the Utah Forwarding Company, with L. E. Riter as superintendent. These mines are shipping from 50 to 100 tons of ore per day to the smelters in Utah and Idaho. This ore is classed as the very best fluxing ore in the country.

The Carrissa.

This property, which is 10,000 feet long, belongs to B. Roberts and others of Salt Lake. Recently they have put down a shaft within a few feet of the south end of the workings in the Northern Spy, striking ore of a high grade at 35 feet from the surface. The vein is at least 10 feet wide. It has only been two months and a half since they began work, and already they are shipping ore. The vein is the same as the Northern Spy, and so situated that both properties could be well worked as one.

The American Eagle is just east of and adjoining the Crismon Mammoth, is the same vein and character, and promises to come to the front soon. At present only a few men are employed.

At Diamond the mines are lead, mostly owned by poor men who are not able to operate them, especially as water is near the surface. The Sunbeam, heretofore valuable in the upper workings, is lying idle from this cause. This is the only vein in this district in granite, and experts say it is the best defined of any.

Crismon Mammoth.

Last but not least is the great Crismon Mammoth property, which is lying idle. We need not at this time enter into the details of the history of this property, as it is well known to the readers of the *Tribune*. Suffice it to say that when it was closed down one year ago, 300 men were thrown out of employment, and ever since the mine and the great smelting plant have lain idle. Soon the property is to emerge from its difficulties, if we may believe reports, and become an extensive institution, which will again people the district with hundreds of miners and smelting men. With all the adverse circumstances surrounding Tintic, it has a big ore output. One-half of the mines are idle, and yet there is shipped ores to the amount of about 150 tons for every day in the year, if we include the shipment of iron ore with the lead-silver ores. This certainly is a good showing, but it ought to be two or three times as great. In 1883 the iron ore shipments amounted to 18,000 tons, while the lead-silver ore shipments aggregated about $900,000 in value. The latter will be double for 1884, while the iron shipments will be about the same. Colorado iron ore has come into competition, and affects shipments here to quite an extent.

The Lost River Region.

A gentleman who recently paid the Lost River country a visit furnishes some interesting news from that section. Ranches in the Big and Little Lost River valleys are fast being taken up by industrious farmers, though as yet the country is but sparsely settled. Every farmer has at least a small patch of grain that his yielded abundantly, and the oats crop was especially good.

The Lost River mining district is making a good showing this season, and promises at no distant day to rank among the leading base-metal producing sections of the Pacific slope. Some of the prospects already developed show every evidence of permanency, and some of the ore produced is of a high-grade, yielding several hundred dollars in silver to the ton.

The Daisy Black, in Hamilton district, beyond Little Lost River, may be taken as a fair average of the mines in that region. The lead is about eight feet by ten, and the ore from face to face will average about 40 ounces of silver and 50 per cent lead to the ton; while small veins through the ledge will assay well into the thousands. The wall-rock is lime and white sandstone. In fact, the mining section of that region seems to be generally of a lime and sand formation, and the ledges of ore-producing rock are well defined and may be traced for miles between these walls. The cost of mining is almost inconsiderable, compared to most sections of the country, and this fact alone will greatly enhance the value of the properties. In several instances experienced men have offered to contract to take out ore from some of the prospects at the rate of $2 per ton, but owners have not been developing their properties, as they are awaiting the arrival of the smelter, which will be in operation now in a few weeks.—*Wood River Times.*

Soda Springs Bubblings.

A. G. McAfee is busy, getting the Eva mine in readiness for work.

Rhodes' marsh, south of here, is shipping considerable salt and horax. About 15 men are employed at the works, and a small army on the marsh.

Mining and milling men and contractors have been paying frequent visits of late, and the rumors in relation to the new Mount Diablo mill at this place are many.

Archie Farington made his first bullion shipment from the new mill last Sunday. There were four bars, valued at $5,600. The mill has five stamps, and is said by experts to be the most complete ever built. It requires only four men on a shift to run it, as the work is almost entirely automatic. The ore goes through the drier, battery, roasters and pans without ever being touched, except by machinery. The bullion is very clean and bright looking, and is 824 fine.—*Walker Lake Bulletin.*

PELTON WATER WHEELS. — The demand throughout this and foreign countries for the Pelton water wheel (a Nevada city invention) continues to increase right along. They are being manufactured in large numbers at Geo. G. Allan's foundry on Spring street. One of 75 horse-power and 5 feet diameter has just been sent to Auckland, New Zealand, where it is to be used by Messrs. Frazier & Tinne in running a twenty-stamp quartz mill, pans, rock-breaker and other machinery. One with a double nozzle and capable of giving 300 horse-power is being made for use in San Francisco. A three-foot wheel is to be put into the Eureka Lake Company's saw-mill at Columbia Hill to run the machinery there.—*Nevada Transcript.*

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

WATER MOTOR.—James H. Culver, S. F., assignor of one-half to W. H. Wiester. No. 305,575. Dated September 23, 1884. The invention consists in a novel construction of a wheel and buckets which can be stamped from a single sheet or plate, a means for mounting it within a case to prevent leakage around the shaft, and a means for supplying water to drive the wheel, together with certain details of construction.

WRENCH.—Benton Elmore, Etna, Siskiyou Co. No. 304,807. Dated Sept. 9, 1884. This invention relates to that class of wrenches in which the approach and separation of the jaws are dependent upon the movement of the handle, and whose bite or grip is proportionate to the pressure wrought upon the handle. The invention consists in the arrangement and connection of the jaws with each other, and of both with the handle. The object is to provide an effective and easily operated wrench.

CABLE RAILWAY CARS.—Henry Root, S. F. No. 304,863. Dated Sept. 9, 1884. This invention relates more particularly to a track brake for cable cars. These cable cars have ordinary brakes on the wheels but track brakes are necessary also. Owing to the peculiar construction of the running gear on the cars of the Market street road in this city, Mr. Root devised details of construction of the track brake and its connections, which this patent covers.

SULKY-CULTIVATOR.—Wm. H. Roberts, Santa Clara, No. 304,861. Dated Sept. 9, 1884. The improvement in sulky-cultivators consists in a single bead or bar to which the grove-neck or stems of the teeth and pole or shafts are received; in the rigid connection between it and said parts; in the arrangement in connection therewith of a crank axle and the scat, and in a smoothing drag-board attached to the head. The object of the invention is to provide an easily handled cultivator adapted to be operated by one or two horses, and to be fitted readily with various forms of teeth.

VELOCIPEDE.—Robert B. Lunsford, Oakland. No. 305,698. Dated Sept. 23, 1884. This velocipede consists in a wheeled frame carrying a seat or chair, and a peculiar foot lever pivoted to the frame behind the rear axle, and extending over and down in front of said axle, being connected with and driving the axle and wheels by means of pitmen extending from said levers to cranks on the axle. The connection between the frame and the front axle, the means of guiding, the seat, the treadles and the draw-bar form details of construction of the inventor.

METAL SHEARING MACHINE.—Robt. I. Knapp, Half Moon Bay, San Mateo Co. No. 304,829. Dated Sept. 9, 1884. This apparatus for cutting plates or bars of metal consists of a combination of devices. The usual method of cutting steel or iron is by means of power or hydraulic shears, which operate with a slow motion and under great pressure. In this apparatus Mr. Knapp employs the momentum of a falling or steam driver weight, carrying one of the shear blades so that it passes the other which is stationery and upon which the plate to be cut may be held.

DEVICE FOR TURNING VEHICLES OUT OF CAR TRACKS.—Theodore H. Macdonald, S. F. No. 305,610. Dated September 23, 1884. This is a device by which the wheels of vehicles may be easily directed out from the channel in street-car tracks where they have been traveling, this being effected without straining the wheel. It consists of a plate, supported by a radial arm or mechanism surrounding the hub of one or more of the wheels. The plate projects beyond the face of the tire or rim of the wheel, and at a little distance from it when out of action, but in such a position that when turned down the wheel may run over it, and it raises the wheel at the instant that the turn is made, so that it is lifted out of the channel in the car-track, passing on to the other portion of the road-bed without injuring the wheel.

GRINDING PAN.—George H. Malter, S. F., No. 304,700. Dated Sep. 23, 1884. This grinder consists of a pan with vertical sides, having a ring or die fixed around its inner periphery, a series of shoes loosely supported upon muller-plate, which is rotated by a central shaft, and has vertical partitions between which the shoes lie, a feed hopper and a deflector within the pan, means for supplying the water and for regulating the discharge. The muller-plate is driven from a central shaft and has its upper surfaces subdivided by tangential partitions. The shoes lie within the spaces thus formed, and are thrown outward by centrifugal force, so as to grind the ore-pulp between themselves and the ring-die. The ore is admitted through a hopper and the center of the pan, and delivered upon a deflector to distribute it outwardly toward the circumference of said pan. In dry crushing, the ore discharges below, and in wet crushing through an opening near the top of the pan.

ENGINEERING NOTES.

Aerial Navigation.

Late experiments under the authority of the French Academy of Sciences appear to give some encouraging evidence that a material advance has been made in the science of aerial navigation. Two French officers, Captains Renard and Krebs, attached to the military balloon workshops at Meudon—if we may trust the circumstantial narration of their experiments, given upon what appears to be most respectable authority have at length succeeded, with the use of a steering mechanism and a screw propeller driven by an electo-motor, of four horse power, which was actuated in turn by the energy developed from a secondary battery, in devising a method whereby a balloon may be navigated in any direction at the will of the aeronants. The details of the experiment in question indicate a decided advance in this field of investigation, and promise to be followed by results of prime importance.

According to the accounts given, the full details of which have been placed before the French Academy by M. Herve Mangon, with the approval of the French Minister of War, at 4 o'clock of the afternoon of the 9th of August last, a balloon, provided with the mechanical devices and motive power above described, and carrying within it as passengers the two officers named, rose from the park at Choisy, near Meudon. The air was calm, and at first the movement of the balloon was scarcely perceptible; but as soon as its motive power was brought into action its pace was accelerated. When it was some two miles from Meudon, the spectators saw it suddenly tack about, make a half circle of 300 yards radius, return to its point of departure, and slowly descend with a dipping motion, until it alighted on the lawn from which it started. The distance covered in going and returning was about four miles and three quarters, and the time occupied in the trip 27 minutes. During the entire trip the balloon is said to have obeyed faithfully the least movement of its helm. The total weight of the balloon, with all its appliances, including the two officers who controlled and directed its movements, was 4,250 pounds. The duration of the force employed in working the screw propeller was estimated at four hours when the full power of the battery was applied. Only a little more than the power of three horses was used on the occasion referred to.

The respectability of the testimony in favor of the correctness of the foregoing account is so unquestionable, that we may safely assume the facts to be substantially as narrated. It would, therefore, appear that, so far as relates to the question of guiding the course of a balloon in any given direction, and to any desired point, to reverse its course and return to the point of departure on a calm day, the experiment of Captain Renard and Krebs at Meudon is conclusive.

The value of the balloon as an auxiliary in modern warfare was fully demonstrated during the siege of Paris, and its future value as a means of conveying intelligence to distant points under similar circumstances, must be immensely increased by the ability to control its course, which the Meudon experiments demonstrated to be practicable. Whether the development of the experiments shall introduce into this method of transportation enough of certainty and safety to make it available for the arts of peace remains to be seen. Let us hope that it may be so. However this may be, the Meudon experiment indicates that the world has entered upon a new era in the history of aerial navigation.

The inventor of this navigable balloon is Captain Renard, who claims that only time and money are now needed to bring this new route into practical use. He says he can construct a balloon which will easily carry one hundred persons in any direction, and that he could insure a balloon postal system as efficient as that of the railroads. The subject of aerial navigation is also receiving the attention of intelligent parties in this country, and it will hardly do now if the powers of the air cannot be overcome by the inventive genius of this wonderful age.

THE STEEPEST RAILROAD GRADE.—Much has been written about the construction of the mountain divisions of the Denver and Rio Grande railroad in Colorado, and the wonderful engineering skill displayed in ascending the California mountains south of Tulare valley, through the Tehachapi pass. But, according to the *Leadville Chronicle*, the little feeder of the Leadville division of the Rio Grande exceeds all other roads in its steep grades and short curves. When the line first went into operation many accidents occurred by the trains breaking away at the top and running back down the steep grades, wrecking locomotives and cars and destroying limbs and sometimes lives. Later, however, extremely heavy locomotives have been built and the most skillful and the bravest train hands employed, who never flinch in the supremest moment of danger. The result has been that accidents now seldom occur. It is said that the sight of one of these trains descending is one of thrilling interest, the sparks from the car wheels cutting a pathway of light down the mountains, which can best be described as having the appearance of a molten stream of fire rushing down to the river-bed of the canyon.

USEFUL INFORMATION.

A Soft Alloy.

A soft alloy, which attaches itself so firmly to the surface of metals, glass and porcelain that it can be employed to solder articles that will not bear high temperature, can, as the Pharmaceutical Record asserts, be made as follows: Copper dust, obtained by precipitation from the solution of the sulphate by means of zinc, is put in a cast iron or porcelain lined mortar and mixed with a strong sulphuric acid, specific gravity 1.85. From twenty to thirty-six parts of the dust are taken, according to the hardness desired. To the cake formed of acid and copper there is added, under the constant stirring, seventy parts of mercury. When well mixed the amalgam is carefully rinsed with warm water to remove all the acid and then set aside to cool. In ten or twelve hours it is hard enough to scratch tin. If it is to be used now, it is to be heated so hot that when worked over and brayed in a mortar it becomes as soft as wax. In this ductile form it can be spread out on any surface, to which it adheres with great tenacity when it gets cold and hard.

A CHINESE FARM HOUSE is a curious looking abode. Usually it is sheltered with groves of feathery bamboo and thick-spreading banyans. The walls are of clay or wood, and the interior of the house consists of one main room extending from the floor to the tiled roof, with closet-looking apartments in the corners for sleeping rooms. There is a sliding window on the roof, made of cut oyster shells, arranged in rows, while the side windows are mere wooden shutters. The floor is the bare earth, where at nightfall there often gathers together a miscellaneous family of dirty children, fowls, ducks, pigeons, and a litter of pigs, all living together in delightful harmony. In some districts infested by marauding bands houses are strongly fortified with high walls, containing apertures for fire-arms, and protected by a moat, crossed by a rude drawbridge.

COPPER FOR ROOFING.—We have already in these columns, referred to the economy of copper for a roofing material. An architect speaks upon the subject of the relative economy and benefits of copper over tin, as follows: We always specify the use of copper for covering roofs, when we can induce owners to allow us to do so, on account of its durability; although its cost is about $14 per 100 square feet over price of tin roofing. But when we reflect that a tin roof requires constant repairs, and painting at least every two years, at a cost of two to three cents per foot, varying as to the number of coats, the cost of repairs for six years, together with the cost of tin roof, equals the cost of copper.

A CURIOUS BAROMETER is said to be used by the remnant of the Araucarian race inhabiting the southernmost province of Chili. It consists of the cast-off shell of a crab, which from its curious application, is called the "Barometro Araucano." The dead shell is said to be extremely sensative to atmospheric changes, remaining quite white in fair, dry weather but indicating the approach of a moist atmosphere by the appearance of small red spots, which grow both in number and in size as the moisture in the air increases, until finally, with the actual occurrence of rain, the shell becomes entirely red, and remains so throughout the rainy season.

THE first patent granted to an inventor in the United States is mentioned in a speech of ex-Senator Wadleigh, of New Hampshire, in the forty-fifth Congress. The senator said: "An intelligent gentleman of my own State has referred me to an Act of the general court of Massachusetts Bay, passed in 1646, granting to one of his ancestors, Joseph Jenks, the exclusive right of making and selling his improved scythe for the term of fourteen years. That, I think, was the first patent granted to an inventor in America. The improvement referred to changed the short, thick, straight English scythe into the longer, thinner, curved implement with stiffened back now in use."

LIQUID BLACKING, or more properly speaking the "liquid gloss," which is much used for ladies' and children's shoes may be easily made by any one, as follows: Take ivory black and molasses, of each one pound, sweet oil and sulphuric acid, of each four ounces. Rub together the first three until the oil is perfectly killed, then gradually add the sulphuric acid, diluted with three times its weight of water. Mix well and let it stand for three hours, when it may be reduced to a proper consistency with water or sour beer.

ROLLED GOLD.—Everybody is familiar with the "rolled gold" jewelry now so abundant in the shops, which are so beautiful in design and workmanship, and so remarkably cheap. It is made by forming a thin layer of gold alloy upon an ingot of brass while it is hot. When this ingot is cool it is forced between steel rollers into a long, thin ribbon, each part of which is of course still covered with the gold alloy, incalculably thin, but which will wear for several years and can be molded into any shape.

IMPROVED METHOD OF JOINING LEATHER BELTS.—Some party has devised an improved method of joining leather belting, which dispenses with stitching and riveting overlapped bands, all that is required being merely to slit the ends of the bands into eight or ten "fingers" and dove-tail them on a long single rivet, or small bolt. This is readily done with a combination tool which has been made for the purpose, and the result has several advantages apart from the saving of time in stitching.

NATURAL GAS IN WASHING.—I will state here that the discovery that natural gas "cuts grease" in clothing, etc., without at all injuring the fabric was accidental. Further experiments in this line would be desirable. How easy wool could be washed after this treatment, clothing cleaned, mail bags and rooms disinfected. Some one will strike a bonanza in applying this gas in this way yet.

EDUCATION IN EUROPE AND AMERICA.—Our system of public education requires an annual expenditure of nearly $98,000,000, only a few millions less than all the nations of Europe devote to the same object. Yet it is a fact that Great Britain expends two-thirds more than that immense sum upon her army and navy.

A VALUABLE INVENTION.—An engineer in Michigan has invented an attachment to steam cylinders which condenses the waste from the steam cock on starting the engine. It does away with the hissing noise which frightens horses and worries men. The engineer has been offered $47,000 for the patent.

COLD AND WARM-BLOODED ANIMALS.—There is less blood in cold-blooded than in warm-blooded animals. The larger the animal the greater is the proportion of blood to the body. Man has about a gallon and a half of blood, equal to one-thirteenth of his weight.

POWER IN TURNING SHAFTS.—If a four-inch and a two-inch shaft are both solid, and each makes 100, or any other given number of turns, in one minute or other specified time, six times as much power will be consumed in turning the larger as in turning the smaller shaft.

LUMINOUS water-proof paper may be made from a mixture of forty parts pulp, ten parts phosphorescent powder, one part gelantine, one part potassium bichromate, and ten parts of water. It can often be used where luminions paint cannot.

BLACK VARNISH FOR IRON.—To make a good black varnish for iron or other metals, dissolve by heat three ounces of asphaltum, four quarts of boiled oil, and eight ounces of burnt umber. Mix the compound with turpentine while cooling.

GOOD HEALTH.

How to Remove Scars.

Scars are always unsightly, and are often painful or inconvenient, on account of their propensity to contract as they become older. Dr. Wark, of New York, asserts that they may be removed by manipulation, which he directs to be employed as follows: Place the ends of two or three fingers on a scar if it be a small one, and on the margin if it be large, and vibrate the surface on the tissues beneath. The surface itself is not to be subjected to any friction; all the motion must be between the integument and the deeper parts. The location of the vibratile motion should be changed every 10 or 15 seconds until the whole scar has been treated, if it be of moderate size. If the scar be the result of a large scald or burn, the margins only should be treated at first; the advances toward the center should be deferred until the nutrition of the margins has been decidedly improved. Only a little treatment should be applied to any one spot at the same time, but the vibrations should be repeated as many as 20 times a day, but never with sufficient frequency or severity to cause pain. If the scar becomes irritable, suspend treatment until it subsides. In the course of two or three weeks of faithful treatment, the surfaces of the scars of moderate size becomes more movable, and will begin to form wrinkles like true skin, when pressed from side to side. All these changes are due to improved nutrition, consequent on better blood circulation—the development of entirely new sets of blood vessels in the cicatricial tissue.

TO REMOVE SUBSTANCES FROM THE EYE.—Dr. C. D. Agnew, in the *American Practitioner*, says that before applying any metallic to the human eye, practitioners or others should use an instrument made in the following manner: Take a splinter of soft wood, pine or cedar, and whittle it into the shape of a probe, making it about the length of an ordinary dressing probe. Then take a small, loose flock of cotton, and laying it upon your forefinger, place the pointed end of the stick in the center of it. Then turn the flock of cotton over the end of the stick, winding it round and round so as to make it adhere firmly. If you will look at the end of such a probe with a 2in. lens you will see that it is quite rough, the fibers of cotton making a file-like extremity, in the midst of which are little interstices. As the material is soft, it will do no harm to the cornea when brushed over its surface. When ready to remove the foreign body, have the patient rest his head against your chest, draw the upper lid up with the forefinger of your left hand, and press the lower lid down with the middle finger, and then delicately sweep the surface in which the foreign body is imbeded, with the end of the cotton probe. When the foreign body is lodged in the center of the cornea, it is most important not to break up the external elastic lamina; for if you do, opacity may follow, and the slightest opacity in the center of the cornea will cause a serious diminution in the sharpness of vision.

DANGEROUS DYES.—An authority on the subject of skin disease, Mr. James Startin, M. R. C. S., has sent a case of exhibits to the Health Exhibition which illustrate the danger of wearing next the skin articles of clothing dyed with substances obtained from benzol and other products of coal tar. That danger has been pointed out many times by medical men, who have given instances of the ill effects caused through the absorption by the skin of these irritating and poisonous compounds. Mr. Startin repeats these warnings, by showing specimens of some of the beautiful aniline colors, rosaniline, magenta, violet red, methy violet, Bismarck violet, etc., and gloves and stockings dyed with the substances by which these hues are obtained, through which, in cases coming under the treatment of the exhibitor, eruptious on the skin of women and children, in some instances of a very severe character, have been produced. In the same case are shown many vegetable dye stuffs, from which no such danger need be apprehended.

SCIENCE AND HEALTH.—Although science has not yet robbed consumption of its terrors, the discovery of the so-called bacillus of tuberculosis has already pointed out to medical men a possible means of saving the lives of many patients. Speaking recently in Paris, Prof. Germain See dwelt upon the importance of searching for this organism in the matter expectorated by persons having apparently slight lung troubles. He regards its presence as an unfailing sign of consumption, for the most careful research has failed to detect it in other lung affections; and as it may be found before the appearance of other symptoms, it may enable the physician to successfully apply treatment in the early and curable stages of the disease.

A DOLL THAT HAD DIPHTHERIA.—The Board of Health of Amsterdam, N. Y., have recently investigated an outbreak of diphtheria, from which two children died, a third, who was attacked, recovering. The disease was traced to a pet kitten, with which a little girl played while the animal was sick with a swollen throat and discharge from the nose. The cat died. The child was taken sick and also died. Another girl played with a doll which had belonged to the deceased child; she was also taken sick and died. Still another contracted the disease without other means or communication than the doll. The latter was supposed to have been disinfected.

DEATHS AT DIFFERENT AGES.—A statistician, Dr. Farr, we believe it was, recently stated that if one could watch the march of 1,000,000 people through life, the following would be observable: Nearly 150,000 would die the first year, 53,000 the second year, 28,000 the third year, and less than 4,000 in the thirteenth. At the end of forty-five years 500,000 have died. At the end of sixty years 370,000 would be still living; at the end of eighty years, 97,000, at eighty-five, 31,000; and at ninety-five years there would be 223; at the end of 108 years there will be one survivor.

CANCER IN ANIMALS.—A writer in the *Jour. Comp. Med. and Surg.* has been investigating the above subject, and describes numerous cases of undoubted malignant disease in lower animals. Of the cases observed, there was in fowls, a chicken, an old hen whose foot had been frost bitten, and a capon. Five cases in horses and mules and one each in a cow and a dog were unmistakably malignant. The fact is also referred to by the writer that pigs are very subject to intestinal tumors and suspicious glandular enlargements.

A STRANGE APPETITE.—An English girl was incommoded by a huge lump in her stomach, which was presumed to be the result of a morbid appetite for hair combings and cotton wool, which she had gratified without stint. Dr. Knowlsley Thornton, the eminent ovariotomist at the Samaritan Hospital, London, made an opening into the stomach, and extracted a large mass of cotton and hair molded into the form of the stomach, and measuring nine and one-half by five inches. The patient was doing well at last accounts.

GRAHAM AND WHEAT BREAD.—From experiments made upon himself, a French savant concludes that contrary to the generally received opinion, whole meal bread, or that containing all the ingredients of the grain, is less wholesome and more indigestible than pure white bread made of the flour alone.

FEMALE PHYSICIANS. — Twenty years ago there were but twelve women doctors in the United States. There are now over eight hundred.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SUTTER CREEK.—Cor. Amador *Ledger*, Oct. 11: The Downs mine has closed down for a time, on account of the illness of R. C. Downs. The prospects were considered good when operations were suspended. The repairing of the Amador sulphurets works is almost completed. A fire will be started in a few days for the purpose of drying the ovens, which will take about a couple of weeks to get them ready for work.

MISCELLANEOUS.—At the Morgan claim in Hunt's gulch connection has been made between the tunnel and shaft. A substantial dwelling and boarding house has been erected near the site of the one destroyed by fire last year. The cost of this structure will be from $1,500 to $2,000. The Manimoth mill was started up Thursday morning.

Calaveras.

NOTES.—*Mountain Echo*, Oct. 11: There is a strong probability of the Invincible mine changing hands in the course of a week or two. Several laborers are engaged in grading off a place on the Stickle's mine, preparatory to erecting a mill and hoisting works. We are informed that a Mexican who has been working on French gulch, recently unearthed a piece of quartz that contained $240.

Kern.

KRAMER MINES.—Calico *Print*, Oct. 11: Judging from the reports that we have recently heard from the mines near Kramer station, 40 miles west of Daggett, in Kern county, there is likely to be a good mining camp established there. We had an interview with J. L. Coffman, one of the owners of those mines, who reports that these prospects in that vicinity are fine and as encouraging as could be expected under the circumstances. We have received a small collection of specimens of copper and galena ores that assay bigh in silver, that came from a half dozen of these mines. Most of the work accomplished so far bas been done by Kilgore, Hewett & Co., who own ten locations, but little work has been done on them besides surface prospecting, excepting the Kramer and Belden. A shaft 40 feet deep has been sunk on the Kramer, and the ledge widens as they go down, and the ore carries a greater percentage of silver than it did near the surface. At this depth the ledge is six feet wide. The shaft on the Belden is down ten feet, and the ledge is eight feet wide. J. L. Coffman and J. R. Maxey are interested in a number of claims including the 'Little Wonder,' Central, Coffman and Maxey. These gentlemen feel confident that these mines can be developed into as fine properties as any others in this desert. The other day Mr. Maxey found a fine ledge of galena that assays high in silver. Some of the ore taken from the above mines contains considerable red oxide, and several small bars of silver have been made from the same by melting the mineral in a common furnace. These mines are about five miles south of Kramer railroad station, and there are about 40 locations. Water has been found within about two miles of the mines in two places, and it is thought it can be found in other places at a depth of about 20 feet. Several buildings have been erected near the mines. A mining district will soon be formed there.

Mariposa.

SNOW CREEK.—Cor. Mariposa *Herald*, Oct. 11: The prospect in mining is still encouraging. First may be mentioned the Grove Bros. & Co.'s mine. The accident of breaking their pump did not cause any serious trouble, but every thing was soon repaired. They have now a three-foot vein of excellent quality. Ward & Co. are running a tunnel to tap a group of veins lying parallel and which prospect well but are too wet to sink any deeper without hoisting machinery, and tunneling is cheaper. James Hall is erecting a mill on Snow creek for his mine the "Vanderbilt;" of course he knows that he has enough in sight to warrant the outlay. Green & Marsh are also sinking a shaft about a mile from the head of Sweetwater (south) and have a two ft vein of an excellent quality. They are down about 45 ft. It contains very rich sulphurets. It may be expecting too much to think that all these veins will pay but the chances look favorable at present.

SWEETWATER MINE.—Cor. Mariposa *Gazette*, Oct. 11: Upon arriving at the "Golden Age" owned by the Messrs. Grove, we were met and conducted through the mine and mill and I was told that they had reached the depth of 130 ft, with an 18 inch vein and favorable prospects. The mill is a 10 stamp, steam-power, substantially constructed and conveniently situated near the mine. Among the mines worthy of mention in that vicinity, are the "Early," "Mountain View" and "Union" owned by Messrs. Rice and Ferguson. They are at present engaged on the "Early" mine and the shaft is now 100 ft deep. The "Mountain View," has a 260 ft tunnel both mines show encouraging indications. Tbeir 8 stamp mill, which has just been completed a short distance from the mine, is acknowledged to be one of the most compact and neatly built mills in the county. It is now running night and day, crushing rock from the "Early" mine. The Revere Brothers are having rich ore taken from their mine on Sweetwater and crushed at the Grove mill. The situation of the mines on Sweetwater, afford the owners an opportunity of working them economically, there being an abundance of timber and water near by. Messrs. Todd & Ward, are busily engaged in prospecting several mines north of Snyder & Co.'s saw mill. They give employment to several miners, and have recently constructed an eating house with a view to boarding their men, and themselves, having heretofore patronized the Ferguson hotel. This company have spent considerable money in developing mines in this section. Under the management of Mr. J. H. Hall the new work on the Mt. Buckingham mine mill, is progressing rapidly. The machinery for a new 10 stamp mill has recently arrived from below, and is on the ground. This mine contains a vast body of ore already exposed and known to be of a paying quality. Quite a number of laboring men and miners are already employed, which number will be largely increased as soon as the mill is ready to crush. In the same neighborhood is the Banner mine, owned by Messrs. Green & Marsh. It was discovered by Mr. J. Green sometime back, who finding it was probably rich, covered it up for the time being, and until recently but little has been known of the supposed rich find. They have lately sunk a shaft 40 ft deed, and are very much encouraged with the prospect. This mining section, which extends over a reasonably large area of country, is yet comparatively new and unprospected for minerals. The chances are quite favorable that, by the time another year rolls around the dearth of mining interest and successes which has prevailed in other portions of the county will be made up for, by the developments which are yet to arise in this new section.

Nevada.

THE AGNES.—*Foothill Tidings*, Oct. 11: This mine is the old Lucky, situated on Union Hill. The old Lucky in former days made some of our citizens quite independent—considerably ahead of the world. Then the old Lucky stopped, or it was supposed that she had stopped. But now under the name of the Agnes she is doing well and promising to do more. Joseph O'Keefe and John Steele are working the Agnes, and last Friday they had a crushing finished at Joe Southern's mill. The crushing was 14 loads of rock (say 21 tons) and the yield was $922.36 in gold, or close on to $66 a load. A lot of heavy sulphurets is to be yet worked. The Agnes ledge is a strong two-footer, with the formation and all surroundings just right for a good mine. In about four weeks another crushing will be had of the Agnes ore.

PENNSYLVANIA MINE.—The Pennsylvania mine will be started up right away, negotiations to that end having been completed last evening. George Mainhart, one of the best practical miners of this district, will be the director of the working organization. The Pennsylvania is one of the mines that the Menlo Company of New York had bonded some three or four years ago, but the Menlo speculated more than it worked mines, and some of the Menlo men did worse than speculate, and so that company failed. Since the bonding to the Menlo and until now the Pennsylvania has been idle, but now the mine is in the hands of workers and not speculators. The incline on the mine is down over 300 ft and drifts have been run on the lode and all show a strong vein of good-milling ore.

MORE INJUNCTIONS.—Grass Valley *Union*, Oct. 11: It is rumored that the anti-debris people, not content with obtaining injunctions against the hydraulic mines, are now going after the drift mines on the strength of the Sawyer decision, which forbids the fouling of the public streams by mining operations; and as an evidence there is truth in the report we received information yesterday that the gravel mill of the Birdseye Mining Company, at You Bet, was shut down on Monday, on the strength of a dispatch received from San Francisco and nearly all the employees of the company discharged. This company was not engaged in hydraulicing, but breasted out the gravel and run it through a stamping mill. Of course water was used in the batteries in the same manner as in quartz mills, and the tailings necessarily carried a considerable amount of sediment, and for that reason such mining may be said to have come within the purview of the Sawyer decision. The same may be also said of quartz mining, although the anti-debris men have been persistently declaring that they intended no interference with drift or quartz mining. If the Birdseye mine has been shut down on threat of an injunction suit it goes in proof that all mining stands in jeopardy of being annoyed and harassed by the irreconcilable anti-miners of the valley regions.

PEABODY MINE.—Quartz of extraordinary richness was struck in the Peabody mine, yesterday. Some of the pieces of quartz were nearly half filled with gold, and besides there were a number of pieces of solid leaf gold that broke off the quartz as it was taken out. The gold had the rusty appearance of the gold that was characteristic of that formerly taken from the Gold Hill ledge, of which the Peabody is considered the extension. The vein where this gold was found was from four to five inches in thickness, and the depth about 180 ft from the surface on the incline. The ledge from which it was taken has also the dip of the Gold Hill vein. The owners in the Peabody feel greatly elated over this rich prospect, and they certainly have great reason to be.

TWO MINES BONDED.—*Transcript* Oct. 11: About three weeks ago a gentleman arrived here from San Francisco. For several days he examined a great many mines and at last he bonded a quartz mine on Gold Flat for $6,000, and has commenced active work upon it. A tunnel is being run. This gentleman has also bonded a gravel mine near the Central house, on the Washington road, and has put men to work on it. He left here on Saturday last for San Francisco, and will thence proceed to New York, and return here again within six weeks, at the end of which time the work on the claims will be so far advanced for he can determine whether or no he will take the properties. In the bonding of these mines he has used his own judgment and believes he has good properties.

WILL START NEXT WEEK.—The repairs of the damage done last winter to the sluices of the South Yuba River tunnel mine, at Hoyt's old crossing, are being pushed ahead as rapidly as possible. Four teams are hauling blocks, which are being put in as fast as they are delivered, and Supt. Emery thinks everything will be completed by Saturday night. Next week the work of mining in the river bed for course gold (of which there is supposed to be a great deal scattered through the gravel) will be begun.

MARYLAND MINING COMPANY.—*Tidings*, Oct. 9: The Maryland mine is on the famous Idaho lode, and the Maryland ground joins the Idado ground on the east, with the pay chute pitching into the Maryland. Last Monday the stockholders of the Maryland met and elected the following directors: S. P. Dorsey, John C. Coleman, Edward Coleman, Samuel Bethel and Stephen Moore. As president of the board and superintendent of the mine S. P. Dorsey was chosen, with Samuel Bethel as secretary and treasurer.

San Bernardino.

BONANZA KING MINE.—Calico *Print*, Oct. 11: We have obtained from a reliable source the following brief summary of the results of developments in the Bonanza King mine, of Providence, in this county, about 100 miles east of here. Under the able management of Thomas Ewing, General Superintendent of the mill and mines of the Bonanza King Con. Mining Co., this mine is making a better record than any other silver mine in California. The Bonanza King mine has been, and is, the greatest mine in San Bernardino county. It has yielded more and finer bullion, been better opened, better worked, and obtained greater results from the ore than any other mine in this great mineral desert. The ore at the deepest opening is as free and as rich as it was at the beginning. The mill has saved an average of the fine assay of pulp of over 89 per cent. for all ore crushed. 13,000 tons of ore have been crushed with their ten stamp mill, and the tailings average less than $13 to the ton. Nearly $1,000,000 has been produced from this mine in eighteen months and ten days.

ANOTHER DIVIDEND.—Calico *Print*, Oct. 11: The Oro Grande Mining Company has just declared and disbursed the September dividend, from the King mine of Calico, the sum of $22,000. This makes the total dividends of last four months $101,000. The work of building Barber's mill and other buildings near it, is progressing as fast as possible. About a dozen mill-wrights and carpenters are at work and a considerable portion of the foundation and framework of the mill is constructed, and it will soon be ready for the machinery, a portion of which is now on the ground. Five houses are being built, to be used respectively as a private residence, lodging house, boarding house, superintendent's office, and assay office. It will be several weeks before the mill will be completed and ready for operations.

Sierra.

IMPROVEMENTS AT THE MARGUERITE.—Sierra *Tribune*, Oct 10: A reporter visited the Marguerite mine this week and found the work on the new plant progressing rapidly. The framework is all up and if no mishaps occur will be completed in another month. The dimensions of the main building are 30x90 ft, with two "Ls," 30x50 ft respectively. The foundations for the new machinery are nearly all in. From the hoisting works to the penstock it is about 900 ft. Between those two points seven towers with sheaves are to be erected; over which the wire rope will pass. Three of the towers are now completed. The penstock and flume are also finished, and the tail race nearly so. The flume is 1200 ft long and 5x6 ft in heigth and width. A 56 inch Leffel double turbine water wheel is in position in the penstock. The wheel will be driven under a 27 ft pressure, and will under full pressure, supply 350 horse-power. This would permit the working of the mine to a depth of 1600 ft with the machinery now being put in. The greater portion of the new plant was designed and patented by Mr. G. Humbert. That gentleman is now at the mine personally overseeing operations and will remain there until the new works are completed and the machinery set in motion. It is expected to have the improvements completed by the first of the month. In the various departments Superintendent Myers is conducting the work in the best manner possible. Underground the outlook is very encouraging. The ledge in the 4th level continues to develop finely. At present it measures about six ft in width. The three-compartment shaft is completed from the surface to the 3rd level. The mill will start crushing in a few days.

GIBSONVILLE.—*Mt. Messenger*, Oct. 11: This is the most prosperous mining camp of Northern Sierra. When the sale of the mining ground between Gibsonville and La Porte is consummated (that may probably soon take place), two tunnels of about a distance of 4,000 feet each, will be started down at the most favorable point near Wallis Creek, southwest of Gibsonville, one and a half miles from the town. Another tunnel in the neighborhood of 2,000 feet will be put in from the head of Little Grass Valley, Plumas Co., three miles north of Gibsonville, directly opposite the main ridge. As this work will be done by European capitalists of unlimited means, engineered by J. H. Thomas, of Oakland, their Financial Agent on this coast, most efficiently assisted by Prof. Stretch, surveyor and mining expert, it will be steadily pushed to successful completion as rapidly as muscle, powder and coin will accomplish the undertaking. The Wild Boar Co., H. Tabor, Supt., San Francisco capitalists, Chapman, of the Pioneer, Grass Flat, being the main interested party, are going ahead slowly with their main tunnel, now in blasting rock. Wm. Towle is vigorously pushing his tunnel ahead through blasting and soft bedrock—half and half—expecting at most any minute to be in the main pay channel of Cox's Fork of Hopkin's Creek. This mine is known as the Nob Hill Claim. Near by Capt. Donahue, of San Francisco, is running two tunnels on separate quartz ledges from where rich specimens were found in the bed of the creek this summer. D. R. Thomas, of Martinez, is operating two claims at Poor Man's Creek, Plumas Co., and Geo. D. Harrington is foreman of the Hopkin's Creek Claim, of which W. B. Thomas is Supt. of the Hopkin's Creek Gold Mining Co. This mining section is looming up in importance, especially as regards quartz interests over there. The Union Co. has done handsomely this year, their gravel being very rich and abundant. Gibsonville Water and Nevada M. Co. are preparing to drift. Main tunnel is in 400 feet, and channel will be tapped in three-quarters that distance ahead by an upraise, affording ample fall. Hydraulicing has been abandoned, and from prospects obtained the lead can be profitably drifted. Jas. Denoon & Co.'s mining property has done well this season. J. B. York has made arrangements with C. W. Cross for the erection of an eight-stamp mill on his ledge in Slug Canyon. A mill has already been purchased, and will be put in place forthwith. The Alaska Co., at Pike City, are working seventy men. The shaft is free of water, pumps are running nicely, and a twenty stamp mill is crushing night and day. Lamping's mill, Messrs. Stewart, Hill, Bothwick and Denmire, proprietors, is crushing quartz from the Del Long ledge. The mining companies over north are laying in their timbers and other winter supplies.

Sutter.

DRY ORE SEPARATOR.—Chico *Enterprise*, Oct. 10: Last Thursday, at the mines near the Butte mountains, in Sutter county, a good and successful trial of the Chaney dry gold separator was made. Out of fifty wheelbarrow loads of dirt, $15 was extracted without the use of water. The dirt went through the machine in one hour and a half, and reduced to two and a half pans of concentrations. The tailings were carefully prospected afterwards to see how much had been lost, and no color was found. The machine is driven by a four horse-power engine, and is of the tumbling barrel process.

Siskiyou.

MINING AT THE KLAMATH.—Yreka *Journal*, Oct. 6: The McConnell claim, on Klamath river, cleaned up $2,000 in the last eight days, with one derrick out of use three days by reason of the breakage of the shaft. The shaft broke square off close to the water-wheel, requiring the removal of the shaft and water-wheel. But for this accident, the yield for the last eight days would have exceeded $3,000. At lower pit good pay is realized in cleaning bed-rock, but not as rich as anticipated. The wheels have plenty of power now, the river having raised by reason of cool weather. At Beebe Bar claim work is progressing steadily with good prospects. This is considered one of the best claims on the river. The Kanaka Company are troubled considerably by seepage water, as their head dam was built on old tailings. The Empire Bar Company are now drifting, and expect to take out considerable money before the winter rains commence. The Fort Jones Company are on bed-rock, and taking out exceedingly rich pay. The Centennial Company have struck fine sand about 25 ft down, and are also working the top ground towards making expenses in going down to bed-rock. Jackson & Crary, at Oak Bar, are realizing good pay, varying from eight to ten ounces a day. Mott & Co. and several other companies at and below Oak Bar are beginning to get down on pay gravel.

Trinity.

A HEALTHFUL MINE.—Trinity *Journal*, Oct 11: Dr. A. F. Lambeth, of Deadwood, visited Weaverville last week. The Doctor is superintending the Brown Bear Mine for the new proprietors, and in answer to our queries regarding the condition of affairs informed us that the Brown Bear was in a "healthy condition—without the least symptom of disease." He is a gentleman of large experience in quartz mining and knows whereof he speaks.

NEW RIVER.—Cor. Yreka *Union*, Oct. 10: People from New River report that district as being rich in quartz but fully supplied with labor, and hence it would be a poor field in which to seek employment; the mines are situated on the Trinity side of the ridge separating that river from the South Fork of Salmon. They are easily accessible from two points on Salmon, both distant some 40 miles from Etna. The one (the upper) is via St. Clair creek, a creek some short distance below Ceeilville, on South Fork of Salmon, the lower via Methodist creek, just below Yocamville. Some 200 men are on the ground, and one 8-stamp mill is already erected, and two other mills, of small capacity, are in course of erection.

Tuolumne.

PROMISING.—*Union Democrat*, Oct. 11: C. L. Lang is operating on a very promising mine on Indian Creek, four miles from Groveland. He says he has a chute several thousand ft long of ore which works from $7 to $12 per ton by free process. The pay chute averages about 18 inches in width. Mr. Lang has worked 30 tons of rock which gave a return of $30 per ton. He is running a tunnel on the vein for the purpose of opening up stopes. When the mine is a little more opened Mr. Lang will erect some arastras, for which there is abundant and easy utilized water power, to reduce the ore.

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, Oct. 11: Rapid progress is making in the incline below the 2800. It is cutting the east clay of the vein as it goes down, the dip of which pretty nearly corresponds with the angle at which the winze is being sunk. The winze is now down a little over 100 ft on the slope. Excellent work is doing in this winze, as it is being sunk at the rate of 30 ft per week. Work has been temporarily suspended in the northwest drift on the 2800 level as the sending out of so much waste rock to be hoisted at the Combination shaft interfered with the sinking at that point. Last week they extracted on the 200 level and sent to the Eureka mill 606 tons of ore and received $5,933.10 in bullion.

OPHIR.—A considerable amount of ore is still being extracted from the fillings of the old drifts on the 250 level, which ore is being sent to the mills. The diamond drill was sent ahead from the face of the drift on the 500 level a distance of 150 ft when it tapped the water in the old works. This water is carried down the shaft to the 1500 and thence flows out to and through the Sutro tunnel. The south drift on the 1300 level is being advanced at the rate of about 60 ft per week. At the joint Mexican, Sierra Nevada and Union Con. winze a station is being cut out at the 3300 level. This station will be completed in a day or two, when a cross-cut will be started west.

ALTA.—The northeast drift on the 2150 level is being steadily advanced. It is expected that it will reach the vein in about 10 days. The water is being allowed to drain out as the work advances and it is thought that there will be no more water to handle when the vein is tapped than there will be at present.

SIERRA NEVADA.—The station at the 3300 level of the joint Ophir, Mexican and Union Con. winze is completed. From this station explorations will be made to the westward, in which direction lies the ore vein found on the levels above. The water is handled without trouble.

ANDES.—The west crosscut from the main north drift is showing a large amount of quartz of excellent quality. The north drift has also shown good material. During the past week a considerable amount of work in the way of retimbering and repairing has been done on the main drift.

BENTON—The drift on the 2150 level is being pushed forward as fast as can be done without bringing out too much water. It will be yet about 10 days before the vein is reached. The water is handled with the pumps running at about six strokes a minute.

SAVAGE.—Good headway is making in the tunnel that is going in from E street. This will explore the vein at the depth of about 200 ft, where it is expected will be found the continuation of the body of ore now being mined in the Hale and Norcross.

YELLOW JACKET.—The old upper levels are still yielding a considerable amount of low-grade ore, and

this yield may now gradually be increased with the increased volume of water in the Carson river. A good deal of prospecting is being done in various directions.

BEST AND BELCHER.—Good headway is being made in the north drift on the 825 level. The drift is now out about 550 ft. Not much work has been done on the 2500 level, as they have been engaged in making repairs to the Bonner shaft.

COMBINATION SHAFT.—The sump below the 3000 level will now soon be completed. The next work will be the cutting out of a station at the 3000 level in which to set up the new hydraulic pump, now in process of construction in San Francisco.

CROWN POINT.—The amount of ore extracted is gradually being increased as the rise of water in the Carson river allows of the running of additional stamps. A considerable amount of prospecting work is being done.

MEXICAN.—The station at the 3300 level of the joint Ophir, Sierra Nevada and Union Con. winze is about completed. From this station a cross-cut will be started west to explore the vein in that direction.

ALPHA.—The vein is now being exposed at the 500 level, where there is a large body of quartz that gives encouraging assays. Cross-cutting in still carried on in the same body of quartz at the 600 level.

CON. VIRGINIA AND CALIFORNIA.—The northwest drift on the 1700 level is making good headway and is in material of a very favorable appearance. Cross-cutting from this drift will soon be in order.

BELCHER.—As the volume of water in the Carson river increases the amount of ore extracted is also increased. A considerable amount of exploring work is being done.

UTAH.—The usual progress is making in the southeast tunnel on the 1950 level. The rock is vein porphyry, and has been hard for a considerable distance.

OVERMAN.—A considerable amount of low grade ore is being extracted through the Petaluma street tunnel. This ore is being worked at the Vivian mill.

Columbus District.

MOUNT DIABLO.—Candelaria *True Fissure*, Oct. 9: During the past week the incline has been sunk 14 ft, and is now 350 ft below the third level. The west drift on the fifth level has advanced 15 ft during the week, and shows ledge matter with a very little low-grade ore. The intermediate, between the fourth and fifth levels, is in 20 ft and shows spots of ore of fine grade. The west drift on the fourth level has advanced 17 ft, and the north cross-cut, from the same drift, has advanced 15 ft. Neither of these places shows anything of value. The intermediate drift, between the second and third levels, and west of the shaft, shows a strong ledge of $35 ore. The east intermediate, between the second and third levels, shows a narrow streak of low-grade ore. The west intermediate, between the same levels, shows a narrow streak of low-grade ore. The remaining portions show no marked changes. Twenty-five men were discharged on Tuesday last, in order to reduce expenses as much as possible while the question of building a mill is being considered.

Cortsz District.

PROMISING.—Cor. Eureka *Sentinel*, Oct. 12: The mining industry generally promises well at Cortez. The Garrison mine, which is the principal one in the district, is looking very well. In fact, while it is yielding now very handsomely, it gives promise of showing up a most important bonanza for the future. The deposit is not a pockety concern. The ledge is a perfectly defined fissure, which varies from 18 inches to 6 feet in width. As to the reduction of the ore, which is plentiful now, and which promises to come out hereafter in greater quantities than ever before, Mr. Wenban, the proprietor of the property, is having the ground graded for the erection of works for milling or smelting process. For the purpose of getting the necessary water, he has laid pipe for a distance of seven miles. He is busy grading roads, etc., preparatory for future work on an extensive scale to correspond with the flattering prospects. He has employed altogether in the neighborhood of 150 men, of various nationalities. Mr. Lane is the day foreman of the mine, and is one of the most experienced and reliable miners in the State. The people in the little camp are cheerful and confidently expecting good things for the future. On a recent run of tailings the company had got out four large silver bricks.

El Dorado Canyon District.

GOOD REPORTS.—Pioche *Record*, Oct. 4: Good reports come in from El Dorado canyon. The mines of the Southwestern Co. are in good condition and there is more ore in sight than ever before in their principal mine. There is a full force of men being worked by this company.

Lewis District.

NEW MILL.—*Silver State*, Oct. 8: James McCormick, who has had much experience in building and running quartz mills, went to Lewis yesterday, to build a new mill for G. W. Bothwell. The mill is intended for working ores from the Pittsburg Con. mine.

Mount Cory District.

MORE HELP FOR THE MINERS.—Walker Lake *Bulletin*, Oct. 9: The Mount Cory mill has worked several lots of ore from Candelaria of late very successfully. It had been doubted whether the ore from that district could be worked by the process in operation at this mill. The good results attending the late trials are very encouraging to all miners in this section. The Mount Cory Co. although abundantly supplied with ore, will occassionally purchase rock from outside mines, in order to help along those who are struggling under the difficulties engendered by want of ready money. As the mill does its work in the cheapest known manner, and as the outside work is done more for the purpose of assisting those who have money tied up in ore, than for profit, the prices paid are liberal in the extreme, and the company, which has done so much for the improvement of business in this county, should receive full credit for its enterprise and energy.

Osceola District.

GOOD REPORTS.—Cor. Eureka *Sentinel*, Oct. 10: Reports from our neighboring camp, Osceola, are also good. The Osceola Company, of which Goodbie & Hampton of Salt Lake are at the head, have at last concluded to bring in water to their placer ground, of which they own some 400 acres. Bishop Black, of Deseret, Utah, having obtained the contract to cut the ditch, will be on the ground in a few days with some 200 Mormons, those men, it is said, having agreed to work for $1 a day and board; those with teams $3 per day. They expect to have the ditch finished by the time the snow will commence to melt next spring.

Pennsylvania District.

BETTER ORE.—Pioche *Record*, Oct. 11: It is believed that a big mine has been struck in Pennsylvania district. The ore is of better grade than any yet found in the district. The claim is a continuation of the Klingensmith ledge.

Taylor District.

HIGH-GRADE ORE.—Cor Eureka *Sentinel*, Oct. 10: Our mines are coming to the front, the Argus Company having unearthed a large body of high-grade ore in the Sunrise claim. The company's mill is running steadily, with the prospect of its doing so for an indefinite period. The Monitor Company are shipping their usual amount of high-grade ore to their mill on Steptoe creek.

White Pine District.

HAMILTON.—White Pine *News*, Oct. 10: We paid a hasty visit to the county seat this week, and were pleased to note an improved condition of things. The change since our last visit in July was marked by a feeling of general improvement. The mining outlook with our neighbors is indeed flattering. About 100 men are at work in the district. All kinds of business has revived, and the feeling of the people is of a healthy tone. We visited Treasure Hill, went through the Stafford mine, but what we saw will have to be deferred, through want of time, till next week. At this time we can only say the old district promises a bright future.

ARIZONA.

WICKENBURG.—Phœnix *Gazette*, Oct. 9: F. A. Pollock returned yesterday from a trip to Vulture and surrounding camps. He informs us that the mill is running steadily and the boys are expecting a pay day on Saturday or Monday next. At Wickenburg the six concentrators are shut down temporarily, awaiting some slight repairs. The six concentrators now treat about 40 tons of tailings daily and it is proposed to add four more machines, which have in fact, already been ordered. Even with this increased capacity there is an immense amount of work ahead, as it is calculated that the tailings aggregate 40,000 tons. John Mulholland and Martin Cummings, old Yavapai prospectors, together with three or four others, are now at Smith's mill, where they are putting in an arastra. From this, it will be seen that times are lively in the northern part of the county.

UNITED VERDE COPPER CO.—Arizona *Miner*, Oct. 6: Our reporter called on Gov. Tritle this morning and requested information as to what the product of the United Verde copper mines has been since the furnace started last year. He very obligingly gave the following figures: The furnace has run to Oct. 1, 1884, 289 days, and Supt. Thomas gives the product by assays at the mines 4,396,951 pounds of refined copper, equal to approximately 2,198 tons. And the product in silver as 237,951 ounces. Estimating the average price of copper at $250 per ton, the gross yield of copper amounts to $548,500; and rating silver at $1 per ounce, $237,951. Total gross product, $787,451. This does not look as though the enterprise was a failure, as has been said by some of our exchanges.

COLORADO.

GENERAL NOTES.—Lexington *Courier*, Oct. 9: The work of removing the Big Chief mill to Empire commenced last week. Eighteen inches of 300-ounce ore has been opened up by Zang & Co., in the Beaver lode, near Empire. Messrs. Veach & Moore are working a new property on McClennan mountain, and their prospects are flattering. Barrett & Co. resumed work on the Tenth Legion mine, at Empire, last Saturday. A new engine will be put over the shaft. John O'Donnell, lessee on the Equator, realized $1,400 from a mill-run recently. It was the result of one month's work. Jones & Roberts have taken a lease on the east drift in the Centennial mine, and have just opened up a nice body of ore. The Baltimore produced over $17,000 last month. Mr. Fillius, the superintendent, thinks the production for October will reach about $20,000. Major Richard Hornbrook is sinking a shaft on the placer grounds below Idaho Springs, with the intention of doing some extensive work. Peter Yost & Co, lessees upon the Baker mine, Kelso mountain, have a vein of solid ore three inches thick, which mills between 500 and 600 ounces per ton. The Atlantic-Pacific tunnel has been redeemed by the stockholders, and we hope to see extensive operations resumed upon it at an early day. There are a number of excellent mines ahead of it. Carothers & Keaggy, owners of the Lawson strike, the Orient, have a still larger pay-streak, and are shipping quantities of ore which runs from $400 to $1,300 per ton. The owners see a fortune in the property. Our sampling works are treating a large quantity of mineral this month, and the best feature of the matter is, that the ore is of an exceptionally high-grade. During the month of September, there were 50 cars of ore, or about 550 tons, shipped from the Georgetown depot, valued at about $75,000.

IDAHO.

COEUR D'ALENE.—Cor. *Oregonian*, Oct. 9: There being no water in the tributaries with which to mine the developments has been confined to the main gulch, commencing about two miles above Eagle and running up the gulch a distance of about seven miles. The gulch itself is more like a mountain basin than anything else. It is from 40 to 120 rods wide, and on the north side, having a general parallel course with it, there are several old river beds or channels having a vertical elevation above the gulch of from 75 to 300 it, through which intersecting ravines supplied with gold washed down from these have cut, and the main gulch is mostly old river beds. This "old wash," as it is commonly called, has been traced for a distance of 30 miles. Thousands of acres of it have been located. In the absence of water to work it, it has thus far been only slightly prospected by shafts and tunnels, the miners waiting for some one with sufficient capital to bring water upon the hills. Messrs. Walsh & Hubbel, old and experienced placer miners from California, are now digging a ditch for this purpose, and when this and other ditches are completed, the Coeur d'Alene region will be an eye-opener to those who imagine that there is nothing there. Men are now packing gravel in sacks from the sides of the mountain upon their backs to water, and making from $25 to $50 per week. When a sufficient number of mining ditches shall be dug the whole aspect of things will be changed. The water being taken from the main gulch, will enable the gulch miners to work to better advantage. Troubled as they are with a superfluity of water, hydraulicing the hill ground will make available the immense resources of wealth which it contains, while the muddy water, turned back into the main gulch, will puddle the bed of Pritchard creek, so that the gulch claims can be successfully opened in the deep ground. Three or four days before leaving home I went over the entire camp where mining has been carried on, and found that less than four acres of bed-rock had been cleaned up, all told. This shows a yield of over $40,000 to the acre. The present output of gold is not less than 1,000 nor more than 1,500 ounces of dust per week. Several of the claim-owners ship their dust directly to Helena, and my estimate is based upon my knowledge as to what these claims yield, the quantity of dust purchased weekly by the banks and taken in by a few of the merchants. It is a mistake to suppose that Pritchard gulch comprises the entire gold field. On Trail gulch several claims are opened, and are proven to be rich, while there is as much to show that Beaver creek is rich as Pritchard gulch itself showed last spring.

MONTANA.

THE LITTLE ROCKIES.—*Inter-Mountain*, Oct. 7: Mr. Frank Gleason has been kind enough to place in our hands a letter received by him from James Wilson, who writes from the Little Rockies under date of September 26th. From the note we condense as follows: I left Helena on the 5th of this month for the Little Rocky excitement. I met a couple of old friends here and got introduced to some of the boys. The country looked very favorable for prospecting, so I took my pony and tools and crossed a divide into the next gulch, where only two claims were being worked. I got on an average 18 cents to the pan. I staked out my claim right there and am now busy building a cabin. I am going to stay here this winter, or just long enough to make my pile, and I can do it right here. The boys in the next gulch are making their $10 to $15 a day, but they have been in here a couple of months and have got their claims in shape. I am sure we can do as well over here—if not better—when we get things fixed. There must be some rattling good quartz leads in these hills, and you bet they will be hunted for at no distant day. How far these diggings extend nobody seems to know, at least none of the boys I have talked with. It is the finest country for game you ever saw. Buffalo, deer, geese and ducks till you can't rest, and a fellow won't have to live on sowbelly and beans all the time. Yesterday Pete McBride found a nugget that weighed between five and six ounces.

THE BULLION PRODUCERS.—Butte *Miner*, Oct. 8: The Parrott Company concentrates about 100 tons of ore a day, and runs through the furnaces about 130 tons. Of the new works only two calciners are as yet in use, and these are running for the Parrott Company. The new works now being completed at the smelter do not belong to the Parrott Company, though the controlling interest is owned by parties who compose the Parrott Company. Everything about the works is running very smoothly under the very skillful management of Mr. Gaylord. The new concentrator for working the ore from Clark's Colusa is nearly ready for use. It will be running this week. A water-jacket furnace is to be put up by the side of the concentrator. The excavating is almost done and the laying of the foundation well advanced. The tramway from the mine to the concentrator is ready for use. At the mine the late improvements are doing good service. The new engines and boilers are at work, and the new hoist, an experiment in this district, works like a charm. The new cages for the shaft have not yet arrived. The Montana Copper Co. are increasing their capacity. They have begun the work of putting up two new calciners and a new concentrator of 75 tons a day capacity. On the Colusa the shaft is down 600 ft. The Montana Parrott mine belonging to this company will be in good working order in about a week. On this mine they have been putting up a new hoist and hoisting works. These are now almost completed, when probably this week the work of taking ore from the 300-ft level will begin. The West Colusa, belonging to the Montana Copper Company, is down about 180 ft. It is not known what this mine amounts to, as no levels have been run. The Liquidator is down 300 ft. From 40 to 50 tons a day are being shipped from this mine. In this mine between 600,000 and 700,000 tons of good concentrating ores are in sight. This is streaked all through with more or less of first-class ore. The Atlantic is an exhibition of faith, for as yet at a depth of 90 ft no lead or sign of a lead is in sight. At the depth of 90 it water was struck. The work of sinking was then suspended until the two-compartment shaft could be well timbered and a steam hoist and pump be put up. When this work is done sinking will be resumed. The hope upon which this work is based is that the copper lode which is known to run from the Big Butte, on the west side of Butte City, across to the Colusa mine, also crosses the valley to the main range. Just east of the claim taken up by the Atlantic Company is a fine prospect of copper at 50 ft called the Greenleaf, and it is on a line between the Colusa and the Greenleaf that this Atlantic shaft is sunk. Some time ago we referred to work being done on the Katy Morris, southwest of town, by Evans, McMillan & Co. Last week they completed a shipment of 50 tons of ore to the Moulton mill and received $1,200 over and above all expenses. This ore was taken out of the stopes above the water level. Last week they put in a No. 4 Knowles sinking pump and a small steam hoist. They propose now to sink the shaft about 60 ft further before running any more levels. At 70 ft the vein was from 18 inches to two ft wide in a level that was run 100 ft. This ore taking first and second class together assayed 40 ounces. The parties doing the work are much encouraged.

NEW MEXICO.

THE SIERRA COMPANIES.—Lake Valley *Herald*, Oct. 9: The report of the Sierra Mining Companies, which has been sent us, is one of the most satisfactory publications of the kind it has ever been our good fortune to examine. The showing in reference to the mines and their condition is very gratifying both to the stockholders and to those who are indirectly interested in the development of the mineral resources of the Territory. It shows to the credit of the Sierra Grande Company for the year the very large amount of $343,032.29. The total expenditure for the year was about $430,000, including an exceptional amount for permanent improvements. These latter are now valued at $233,857.44. The ores which had been shipped to the smelter and not yet accounted for at the time the report was made were valued at $121,822.73. The Sierra Bella has produced within the year almost a quarter million of dollars worth of ore and has paid its first dividend of $30,000. The report of the manager, after giving a description of the property and of its geological formation, reaches these conclusions: "First, the working of the mines has yielded a profit. Second, the more extended the work became the better were the results, *i. e.*, the more ground has been opened the more ore was found. Third, the more ore was taken out, and the more prospecting was done, the more apparent became the permanency and structural regularity of the ore bodies." The mine is fulfilling all of the favorable predictions the *Tribune* and *Herald* have ever made for it, and that it has a great future as a producing mine there can be no doubt.

UTAH.

REVIEW.—Salt Lake *Tribune*, Oct. 10: For the week ending October 8th, inclusive, the receipts of bullion and ore in this city were as follows: Bullion, $149,260.64; ore, $21,900; total, $171,160.64. For the previous week the total receipts were $170,112.30, of which $126,702.30 was bullion and $43,500 ore. During the week last passed the Horn Silver shipped in 19 cars of bullion, valued at $57,000, making the total shipments of this company for this year to date $1,953,000. The shipments of the Ontario for the week were 56 bars, assaying $41,057.30; total for 1884 to date, $1,320,295.50. The sixth level of the Ontario is being driven through the new west ground toward the Daly shaft. It has still something more than 2,000 ft to go, although the face is now 1,400 ft west of shaft No. 3. The lateral drain tunnel is kept a hundred ft or so ahead of the opening on the vein. The fifth level is not far behind. The two have to be run substantially together, and connected by winzes to keep the air good. The ninth level must now be opened east and west, from shaft No. 2, 600 or 700 ft. Ore is being taken from the west ground on the eighth and from the sixth, up well toward the third. Completing the sump and station on the tenth level, shaft No. 3, still awaits the slacking off of the water rising from the bottom of the shaft, but Mr. Chambers thinks they will undertake to do it anyhow, within a month or so. Mr. Daly is tanking water, and at the same time putting in pumps, additional boilers, building ore houses, and generally preparing for winter work. It is expected he will be ready to start the pumps in 30 or 40 days. He cut through the hanging wall of the vein about 200 ft south of the shaft, and ran into it 12 ft, 3 ft of which was in ore that it is thought will average 100 ounces. Whether he struck the foot-wall or no is uncertain. The strike is very encouraging for the Ontario, as showing the probable, almost certain, continuance of their vein 3,000 to 4,000 ft west of shaft No. 3. The Ontario paid its 99th dividend on the 30th of September. Dividends paid this year, $675,000; grand total of dividends, $5,825,000. Assessments, none. The Mountain Chief Mining Company starts its one-stack smelter to-day. The company has 67,500 shares, par $10, and it is chiefly owned in St. George, W. B. Pace being president and practically the manager. One goes up the Clara, 12 miles from St. George, to the smelter. Thence it is about the same distance to the mine. There are eight locations, 600x1,500 ft—about 160 acres. The outcrop all over is said to be a copper-stained rock, and it was only by accident that it was found to lead to carbonates. It has developed wonderfully, according to accounts, recently. Mr. Dewey, one of the owners and directors, says they claim to have found a cave containing a body of ore 22 ft thick, 40 ft wide and 300 ft long. The ore is a carbonate carrying 65 lead and 15 silver, as near as can be told, and apparently improving in quality.

WASHINGTON.

THE WORKING OF OUR MINES.—Kittitas *Localizer*, Oct. 9: The value of our mines is much enhanced by the abundance of good timber and the large supply of water that is found throughout all the mining camps of this county. There is a large field open for capital to make good investments, and there are many opportunities for experienced miners with capital to realize large profits from working the ores now discovered. Many of these mines, although imperfectly worked, and none of them penetrated to any great depth, show rich deposits of pyrites of iron and free gold. The mines that have been worked have been controlled by men without experience in mining, who were loth to employ men who possessed a knowledge of the business. In short, the wages asked were thought too high to justify the outlay. The mines were worked by inexperienced owners, and the processes employed, so imperfect, that less than half of the gold was saved, and instead of making money out of rock worth $40 a ton, they were run at an absolute loss and a great waste of labor and money, the latter of which might have been saved if an expert had been employed to superintend the process of reduction. As there are no means of transportation at command, reduction works will have to be erected contiguous to the ore beds where the precious metal can be extracted economically, until such time as facilities for shipment are created that will not absorb all the profits in the handling of the crude ore. In time many of the mines may find an outlet to lake Cle-el-um and then down it to the Yakima river, but as that time is several years distant some means must be employed for the present to test the worth of these mines. One small mill erected in the district might be the means of testing the worth of nearly all the mines in the Cle-el-um country.

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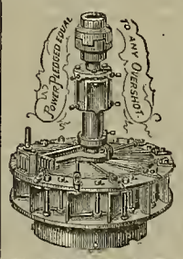

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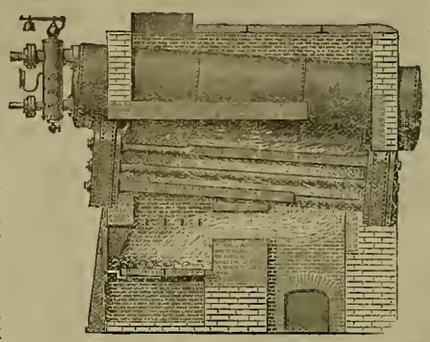

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To Mr. H. Heine, Civil Engineer: In reply to your inquiry of September 24, we respectfully inform you that the three boilers built under your patents, under steam since September 25, 1881, at the Alexander Place Depot, as well as the two at Friedrich Strasse Depot, under steam since September 22, 1882, have given good satisfaction, requiring no repairs whatsoever to date. The internal cleaning of the boiler was always accomplished with ease on account of the convenient arrangement of the tube caps, the adhesion of scales being fully prevented thereby, and the boilers kept in prime condition.

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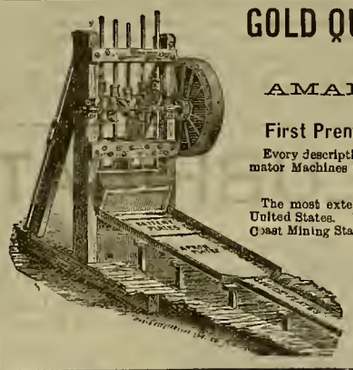

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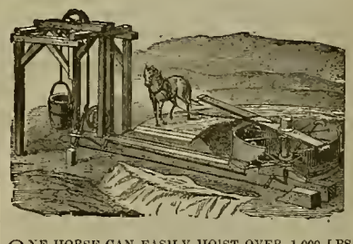

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Mining Share Market.

The interest manifested in politics this week has contributed still further to the dullness in the stock market and transactions have been light. At the north end of the Comstock the station at 3300 level of the deep winze is about completed, and the next work in order will be the running of a west crosscut to explore the bodies of quartz found above and lying to the west. At the Ophir they will soon tap the old works with the drift now being advanced on the 500 level. The diamond drill has been put in and the water is now being drained off. It is expected that a considerable amount of ore will be found between the 500 and the 250 levels. At Gold Hill the several mines are taking out and sending to mills on the river a great deal of low-grade ore. The Overman is now to be counted among the Gold Hill mines that are producing ore. In the California they will soon begin a search for low-grade ore on the 1700 levels, to the northward of where ore was being taken out at the time of the fire in the old timbers. At the Best and Belcher and Gould and Curry they will soon be ready to begin cross-cutting on the 825 level, where there is a good deal of ground that has never been explored.

The following mining companies had the amounts mentioned, on hand, on the first of the month: Alta, $29,738.26; Argenta, $104.34; Alpha Con., $11,239.89; Bulwer, $4,413.80; Best and Belcher, $26,656.04; Benton Con., $21,218.29; Bodie Con., $81,332.56; Belcher, $16,293.15; Crown Point, $24,649.24; Chollar, $29,564.17; California, $19,380.55; Con. Virginia, $14,156.54; Exchequer, $8,126.14; Gould and Curry, $25,185.45; Hale and Norcross, $7,995.54, Mexican, $23,598.22; Mono, $24,832.26; Martin White, $5,759.50; Navajo, $69,378.45; Ophir, $19,420.80; Occidental, $3,201.38; Potosi, $44,011.20; Savage, $2,803.82; Sierra Nevada, $34,583.22; Tioga Con., $821.83; Union Con., $32,596.28; Utah, $7,900.41.

Bullion Shipments.

Drum Lummon, Oct, 10, $10,000; Mt. Cory, (for September,) $43,872; from Georgetown, Col., (for September,) $75,000; from Silver Plume, Col., (for September,) $45,000; Moulton, Sept. 29, $7,011; Dexter, 29, $3,595; Alice, 29, $9,600; Silver Bow, 30, $6,720; Lexington, Oct, 1, $9,400: Alice, 1, $6,795; Moulton, 3, $8,286; Alice, 3, $4,155; Hanauer, 7, $5,750; Stormont, 7, $1,800; Wood River ore, 7, $4,200; Christy, 7, $3,530; Ontario, 7, $8,731; Horn Silver, 7, $9,000; Hanauer, 8, $1,950; Crescent, 8, $3,050; Christy, 8, $1,685; Ontario, 8, $4,520; Horn Silver, 8, $1,200; Hanauer, 9, $3,800; Wood River ore, 9, $2,230; Ontario, 9, $10,570; Vienna, 9, $4,550; Horn Silver, 9, $12,000; Horn Silver, 10, $6,000; Christy, 10, $1,657; Horn Silver, 11, $6,000; Ontario, 11, $4,302; Christy, 11, $1,800; Hanauer, 12, $5,450; Horn Silver, 12, $6,000; Ontario, 12, $6,004. The banks of Salt Lake city report the receipt for the week ending Oct. 8th, inclusive, of $149,260.64 of bullion, and $21,900 of ore; a total of $171,160.64.

WHAT IS THE DIFFERENCE BETWEEN "PEBBLE" AND "GLASS" IS ASKED EVERY DAY.—"Pebble," which always retains its transparency, is much more highly prized for its greater hardness, and being cooler and possessing greater refractive power, a better conductor of heat than glass. "Glasses" are more or less influenced by the damp state of the atmosphere, become turpid, soil more readily, thereby rendering them more difficult to keep clean, and much more liable to become scratched in use. The nature of the material of which lenses are made can be best ascertained by determining the co-efficiency of light; by placing the lenses between two plates of tourmaline, called pebble test, which neither the flint or crown glass can the light pass through, showing the greater transparency of the pebbles over glass; of course taking for granted that where "rock crystal" is used, if not homogeneous, but of a stratified growth, that the lenses will be cut at right angles to the axis of double refraction, as such lenses would be bi-refringement and split up a ray of light, making them very injurious to the sight and having no advantage over glass, only in cheapness. "Rock crystal" lenses badly cut, either through carelessness or design, in order to cut the largest number of lenses from a given piece of rock, may be found at the Cheap Johns and other venders of spectacles, claiming for them all the good qualities possessed by the justly celebrated Pebble Spectacles, obtained only at C. MULLER'S Optical Depot, 135 Montgomery street, near Bush, opposite the Occidental. X

THE Alice, at Butte, Montana, is still improving, the August output having been the largest of any month in the history of the property.. Dividends so far paid aggregate an even million dollars, consisting of 10 dividends of $10,000 each, and 2 of $50,000 each.

SIXTY men are at work on the smelter recently shipped to Big Lost river, Idaho, by Penner Bros. & Co. It will be in operation in a few or twenty days. It will have a capacity of thirty tons per day.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	No.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M & M Co	Alaska	8	70	Oct 14	Nov 15	Dec 5	E F Stone	306 Pine st
Arnold G & S M Co	Arizona	2	50	Aug 1	Oct 1	Oct 28	A Judson	320 Sansome st
Andes M Co	Nevada	25	25	Sept 23	Oct 28	Nov 20	B Burris	309 Montgomery st
Butte Creek Hyd M Co	California	10	10	Sept 23	Nov 6	Nov 29	R L Taylor	230 Montgomery st
Cueva Santa M Co	Mexico	3	05	Sept 13	Oct 15	Oct 31	W L Oliver	328 Montgomery st
Con Imperial S M Co	Nevada	21	10	Sept 1	Oct 7	Oct 28	C L Mettoy	309 Montgomery st
Cabrera M Co	Mexico	9	03	July 18	Nov 1	Dec 1	C Bovie	328 Montgomery st
Daisy Cement M Co	California	2	02	Sept 26	Nov 8	Nov 29	C J Collins	512 Montgomery st
Day S M Co	Nevada	15	75	Sept 26	Nov 3	Dec 2	E M Hall	327 Pine st
Excelsior W & M Co	California	7	50	Sept 2	Oct 7	Oct 28	W J Stewart	215 Sansome st
Kintracht Gravel M Co	California	16	05	Aug 26	Sept 1	Oct 18	H Kunz	209 Sansome st
Golden Fleece G M Co	California	34	40.00	Oct 13	Nov 13	Dec 8	F Schirmeier	412 Sixth st
Indian Spring Drift M Co	California	3	03	Sept 17	Oct 18	Nov 15	A B Paul	328 Montgomery st
Justice M Co	Nevada	41	15	Sept 11	Oct 11	Nov 5	R E Kelly	412 California st
Lamphire G M & M Co	California	1	10	Oct 3	Nov 17	Dec 8	A Martin	526 Montgomery st
North Gould & Curry M Co	Nevada	7	25	Sept 3	Oct 6	Oct 23	C H Mason	331 Montgomery st
Peerless M Co	Arizona	2	25	Sept 25	Nov 3	Nov 29	A Waterman	309 Montgomery st
Solid Silver M Co	Nevada	4	10	Sept 23	Oct 25	Nov 12	R Hewson	5 First st
Sterling M Co	California	1	05	Sept 18	Oct 23	Nov 20	W H Allen	306 Pine st
Savage M Co	Nevada	60	50	Sept 5	Oct 7	Oct 27	E B Holmes	309 Montgomery st
Tunitas Petroleum Co	California	2	1.00	Sept 29	Oct 31	Nov 15	S F Springer	601 California st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	Annual	Oct 27
Exchequer M Co	Nevada	C E Elliott	309 Montgomery st	Annual	Oct 20
Eureka Con M Co	Nevada	E H Willson	328 Montgomery st	Annual	Oct 20
General Lee M Co	Nevada	C E Gillett	434 California st	Annual	Oct 18
Homeward Bound Ptr M Co	California	D A Smith	205 Post st	Annual	Oct 24
Happy Valley M Co	California	D M Kent	330 Pine st	Annual	Oct 24
Mayflower M Co	California	J Morizio	338 Montgomery st	Annual	Oct 20
Silver Lake M Co	Nevada	L J O'Farrell	420 California st	Annual	Oct 20
Trinity G M Co	California	J M Leffridge	528 California st	Annual	Oct 29

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	G W Sessions	309 Montgomery st	50	June 5
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Oct 8
Idaho M Co	California			4.00	Apr 2
Jackson M Co	California	D C Bates	309 Montgomery st	10	Mar 18
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 21
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Apr 23
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Mar 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Sept 5

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept. 25.		WEEK ENDING Oct. 2.		WEEK ENDING Oct. 9.		WEEK ENDING Oct. 16.	
Alpha	1.40	1.60	1.45	1.95	1.40	1.60	....	1.25
Alta	1.65	2.20	1.90	2.10	1.55	1.95	1.65	1.75
Andes	.20	.25	.10	.15	.10	.15	....	.10
Argenta	....	....	....	....	....	....	....	....
Belcher	....	.80	.90	1.00	.85	.90	....	.80
Belding	....	....	....	.40	.25	.10	....	....
Best & Belcher	2.15	2.30	1.85	2.20	1.60	1.95	1.75	1.85
Bullion	....	....	....	.40	.25	.30	....	.25
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	.55	.60	.50	.55	.40	.50	.40	.45
Bodie Con	1.95	2 10	2.00	2.40	2.05	2.35	2.10	2.20
Benton	.50	.60	.50	.60	.45	.60	....	.50
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	....	.55	.50	.65	.60	.65	....	.55
California	.30	.35	....	.30	.35	.40	.35	.40
Challenge	....	....	....	.20	.20	.25	....	....
Champion	....	....	....	....	....	....	....	....
Chollar	2.10	2.50	2.10	2.35	2.05	2.15	2.00	2.15
Confidence	....	1.00	....	1.20	1.00	1.25	....	....
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	.20	.25	....	.20	.15	.25	.15	.20
Con. Pacific	.60	.90	.50	.65	.60	.90	.80	1.00
Crown Point	....	1.30	1.20	1.50	1.40	1.60	....	1.35
Day	....	.35	....	.05	....	.05	....	....
Eureka Con	3.25	3.30	....	3.00	2.90	3.10	3.10	3.20
Enfra Tunnel M Co	....	....	....	....	....	....	....	....
Exchequer	.30	.80	.25	.35	.25	.35	....	.25
Grand Prize	.40	.45	.35	.40	.30	.40	.25	.35
Gould & Curry	1.80	1.95	1.40	1.80	1.20	1.45	1.15	1.20
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	2.85	3.25	2.85	3.05	2.50	2.90	2.45	2.75
Holmes	....	....	2.75	3.00	2.50	3.50	3.25	4.00
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	....	.15	.10	.15	.10	.15	....	.10
Martin White	....	....	....	....	....	.50	....	.40
Mono	1.05	1.40	1.30	2.00	1.35	1.80	1.50	1.65
Mexican	1.55	1.80	1.50	1.70	1.20	1.55	1.20	1.35
Mt. Diablo	....	....	2.40	3.00	3.00	3.25	3.25	3.50
Northern Belle	....	....	....	....	....	....	....	....
Navajo	3.60	3.75	3.00	3.60	3.55	3.60	3.60	3.65
North Belle Isle	.30	.40	.35	.40	.40	.45	....	.45
Occidental	1.30	1.40	....	1.25	1.10	1.25	1.20	1.25
Ophir	1.30	1.40	1.15	1.30	1.05	1.20	.80	1.10
Overman	.15	.20	....	.15	.15	.20	....	.15
Potosi	1.30	1.50	1.25	1.35	1.00	1.25	1.00	1.10
Final Con	....	....	....	....	....	....	....	....
Savage	1.25	1.40	1.00	1.20	.85	1.35	1.25	1.30
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	1.40	1.65	1.35	1.50	1.25	1.40	1.05	1.30
Silver Hill	....	.05	....	....	....	....	....	....
Silver King	....	....	....	4.25	4.10	4.25	....	....
Scorpion	....	.20	.20	.25	.20	.25	....	.15
Syndicate	.40	.45	.45	.50	....	.45	....	.50
Tioga	....	....	....	....	....	....	....	....
Union Con	1.25	1.35	1.15	1.30	1.05	1.20	....	1.05
Utah	.75	1.30	1.10	1.30	1.05	1.20	.80	1.00
Yellow Jacket	1.75	2.00	1.75	2.00	1.80	2.00	1.65	1.90
	....	....	....	....	....	....	....	....

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Oct. 16, 1884.

ANTIMONY—Per pound			
Hallet's	13	@	—
Cookson's	14	@	—
BORAX—Refined	9	@	9½
IRON—Glengarnock, ton	25 00	@	—
Eglinton, ton	24 00	@	—
American Soft, ton	25 50	@	—
Oregon Pig, ton	—	@	—
Clipper Gap, Nos. 1 to 4	30 00	@	32 50
Clay Lane White	25 50	@	—
Shotts, No. 1	26 00	@	—
Refined Bar	3	@	5½
Boiler, 1 to 4	5 00	@	5 50
Plate, 5 to 10	4½	@	4¾
Nail Rod	7	@	—
Norway, according to thickness	6	@	7
STEEL—English, lb	16	@	25
Black Diamond, ordinary sizes	14	@	—
Drill	15	@	—
Machinery	12	@	14
COPPER—Ingot	15	@	16
Braziers	16	@	39
Fire-box sheets	28	@	—
Bolt	23	@	25
Old	12½	@	15
Bar		@	—
Cement, 100 lbs	12	@	—
Copper in New York, Oct. 15	13	@	—
LEAD—Pig	3½	@	4
Bar	5¾	@	—
Pipe	7	@	—
Sheet	8	@	—
Shot, discount 10% on 500 bags. Drop, ¾ bag	1 85	@	—
Buck, ¾ bag	2 05	@	—
Chilled, do	2 25	@	—
TIN PLATES—Charcoal	7 00	@	7 25
Coke	5 75	@	6 75
Pig	19 00	@	20 00
Banca tin	22	@	23
I. C. Charcoal Roofing, 14x20	6 25	@	6 50
ZINC—German	9	@	10
Sheet, 7x3 ft, 7 to 10 lb, less the cask	9	@	10
QUICKSILVER—By the flask	30 00	@	—
Flasks, new	1 05	@	—
Flasks, old	85	@	—

MR. JAMES G. FAIR, of the famous bonanza firm, is on his way home from England.

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Oct. 16.

50	Alpha		1.35
570	Bodie		2.10
150	B. & Belcher		1.75
100	Bullion		30c
200	Belle Isle		50c
200	Belmont		1.15
100	Belcher		85c
200	Chollar		2.05
600	Con. Virginia	55c@	60c
100	Con. Pacific		85c
150	Crown Point		1.35
100	Exchequer		25c
100	Gould & Curry		1.15
1850	Hale & Nor	.2.80@	2.85
150	Mono		1.50
100	Mexican		1.10
50	Mt. Diablo		3.40
300	Ophir		30c
100	Silver King		4.15
300	Savage		1.30
60	Sierra Nevada	1.00@	1.05
450	Union		1.09

AFTERNOON SESSION.

500	Alta		1.90
200	Andes		10c
100	B. & Belcher		1.80
560	Benton Con		55c
50	California		35c
250	Crown Point	.1.40@	1.45
80	Grand Prize		1.25
250	Gould & Curry		1.20
612	Hale & Nor	.2.85@	2.90
100	Holmes		3.25
150	Justice		25c
100	Mexican		1.20
300	Mono		1.55
200	Ophir	.80c@	85c
350	Overman		20c
200	Occidental	.1.35@	1.40
200	Potosi	.1.10@	1.15
20	Seg. Belcher		1.00
100	Savage		1.35
50	Utah		85c
320	Union		1.05

UTAH ore-shippers and smelting men complain that better rates are given to ore-shippers from the Idaho mines to Omaha than to Salt Lake. The freight agent of the Union Pacific says the Omaha smelters pay more for Wood river ore than Utah men do, and it is not because of discrimination that Utah does not get the bulk of the trade.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & CO.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING OCTOBER 7, 1884.

306,211.—DRAFT EQUALIZER—O. C. Beck, Rickreal, Or.

306,134.—PORTABLE DERRICK—Donald Crane, Woodland, Cal.

306,225.—DIMINISHING THE CONSUMPTION OF BATTERY IN NORMALLY CLOSED CIRCUITS—C. Cummings, Reno, Nev.

306,144.—MAGAZINE GUN—W. R. Finch, Eureka, Cal.

306,145.—ORE PULVERIZER—D. V. Goodson, Bodie, Cal.

306,152.—PUMP—Geo. P. Harding, Woodland, Cal.

306,273.—SHEEP DIP—H. B. Marshall, Pomona, Cal.

306,173.—BARREL-TRUSSING MACHINE—Thos. Murphy, S. F.

306,188.—DEVICE FOR RAISING AND LOWERING WINDOWS—Harriet W. Strong, Oakland.

306,122.—BEE HIVE—M. Van Ensley, McMinnville, Or.

306,368.—ROTARY PLOW FOR SUBMARINE WORK—A. W. Von Schmidt, S. F.

306,300.—HAY PRESS—H. L. Whitehead, Island City, Or.

Patents Allowed.

Among patents recently allowed, and not yet announced, we are at liberty to mention the following which will soon issue:

CONCRETE—E. L. Ransome, S. F.
LUBRICATING CUP—J. T. Smith, S. F.
GATE—C. W. Scott, Lemoore, Cal.
GOVERNOR—J. P. Simmons, S. F.
FIRE ESCAPE—C. J. Shore, Sacramento.
BILL PLATE, CARD RECEIVER—J. S. Matthers, Alameda, Cal.
OVERSHOE—H. O. Hooper, S. F.
GREASE TRAP—N. T. Whiting, S. F.
GOLD EARRING APPARATUS—Brown & Field, Lemoore, Cal.
TWO-WHEELED VEHICLE—J. A. Bilz, Pleasanton, Cal.
TYPE WRITER—E. S. Belden, S. F.
LINING FOR CHIMNEYS—J. Browell, S. F.
APPARATUS FOR MAKING EXPLOSIVE COMPOUNDS—E. B. Hardy, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise), at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

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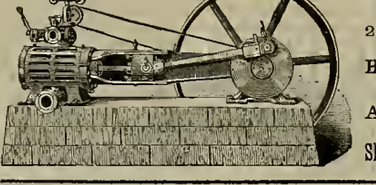

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JARED C. HOAG - California.
J. J. BARTELL—Sacramento Co.
A. C. KNOX—Nevada (State).
B. W. CROWELL—Fresno and Tulare counties.
GEO. MCDOWELL—Amador and Calaveras counties.
WM. PARCOE—San Francisco.
WM. H. COOK—Los Angeles Co.
H. G. PARSONS—Montana and Utah.
G. W. INGALLS—Arizona.
D. K. BRAMBLE—Humboldt and Del Norte Co.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

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BY GUIDO KUSTEL,

MINING ENGINEER AND METALLURGIST.

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Yours truly, P. VEASEY,
34 California St., S. F.

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Mr. F. A. Huntington, San Francisco, Cal.—DEAR SIR—In reply to your inquiry concerning the working of your Centrifugal Roller Quartz Mill, I am pleased to say that I run one of them for seven months, doing custom work on different varieties of rock, and that the mill gave satisfaction in every respect, and did all that you claim for it.

Yours truly, BYRON JENNINGS.

GARIBALDI MINE, Dec. 17, 1883.

F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR—In reply to yours of the 10th inst., I take pleasure in assuring you that your Centrifugal Roller Quartz Mill gives entire satisfaction, and I can heartily recommend it to mining men who want a cheap and efficient crusher.

Yours truly, E. I. PARSONS, Supt.

32 WASHINGTON AVENUE,
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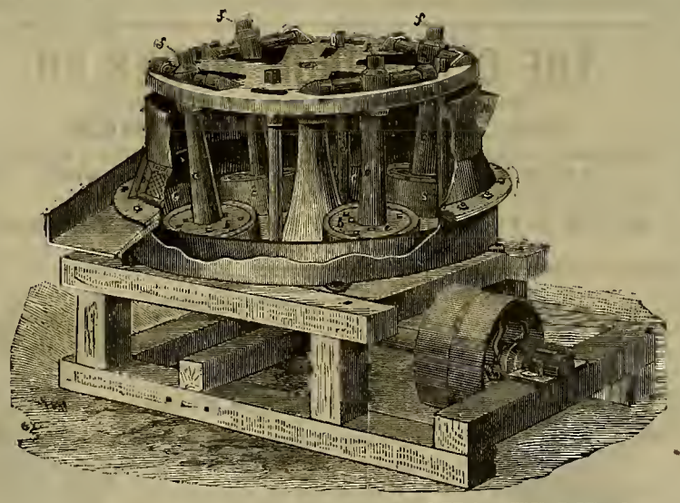
F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR: Having run one of your Centrifugal Roller Quartz Mills on sample lots of rock from more than twenty different mines, I must say that in every instance it has given the best of satisfaction in every particular; and I recognize its superiority over any other mill manufactured.

Very truly yours, D. O. MOWRY.



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6. The wearing parts are easily duplicated.
7. It has a much better discharge, and leaves the pulp in better condition for concentrating.
8. It is a better Amalgamator, saving fully nine-tenths of the gold in the mill; the balance can be saved on plates in the usual manner.
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Yours truly, J. H. NEALE.

GARIBALDI MINE,
Calaveras Co., Cal., Dec. 17, 1883.

F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR:—In answer to your inquiry concerning the working of the five feet Centrifugal Mill, bought of you for the Garibaldi mine in Calaveras county, I take pleasure in saying it gives entire satisfaction in every respect, and I only regret that the mine does not warrant the purchase of more of them and the continued use of the one now in operation.

Very truly yours, O. B. SMITH.

F. A. Huntington Esq., San Francisco, Cal.—DEAR SIR—Your Centrifugal Roller Quartz Mill has run on the Whidden Gold Mining Co. property at Shingle Springs, El Dorado Co., Cal., about four months, and it has done good and satisfactory work, a greater proportion of gold remaining in the mill than in the stamp battery. FRED JONES, Supt.

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January 11, 1884.

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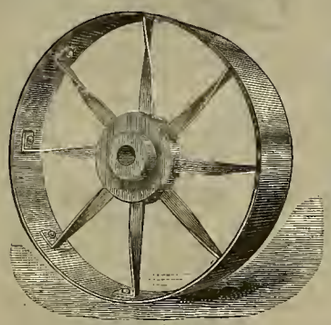

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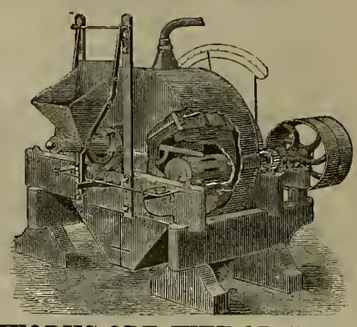

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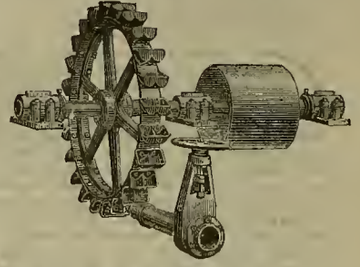

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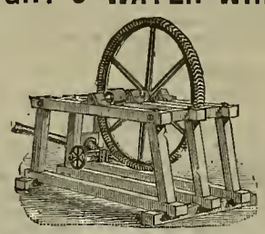

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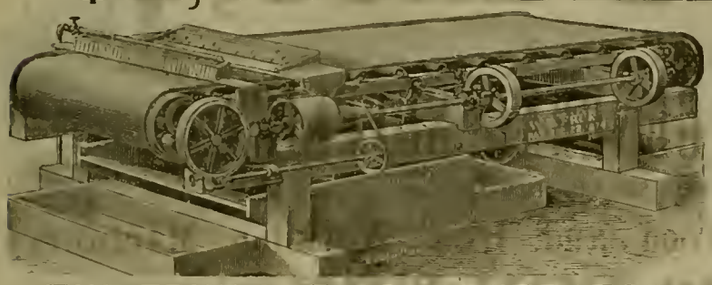

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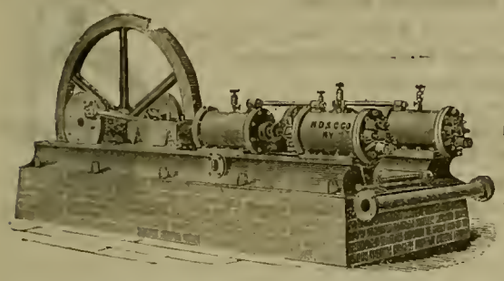

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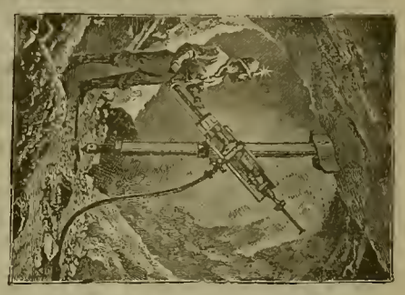

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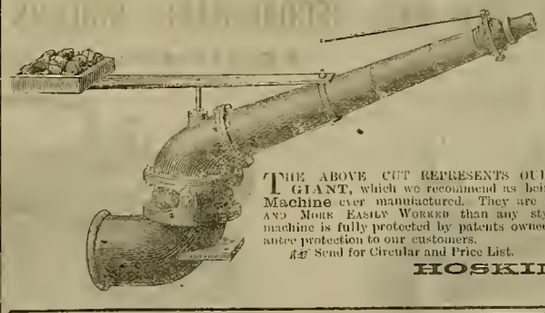

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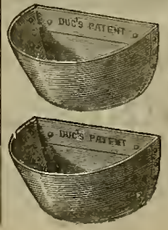

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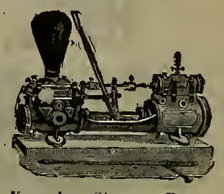

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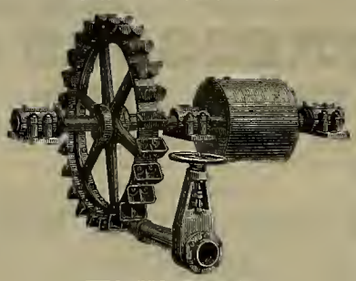

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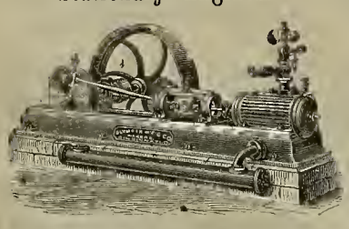

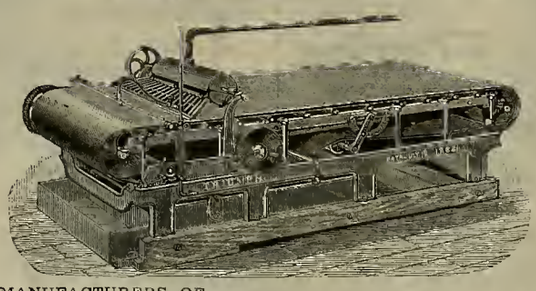

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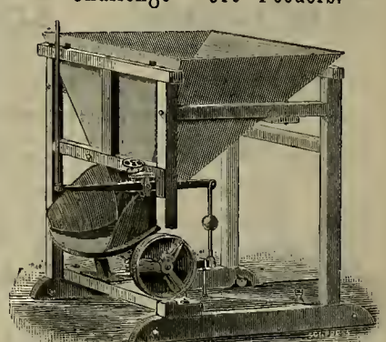

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MINING AND SCIENTIFIC PRESS.

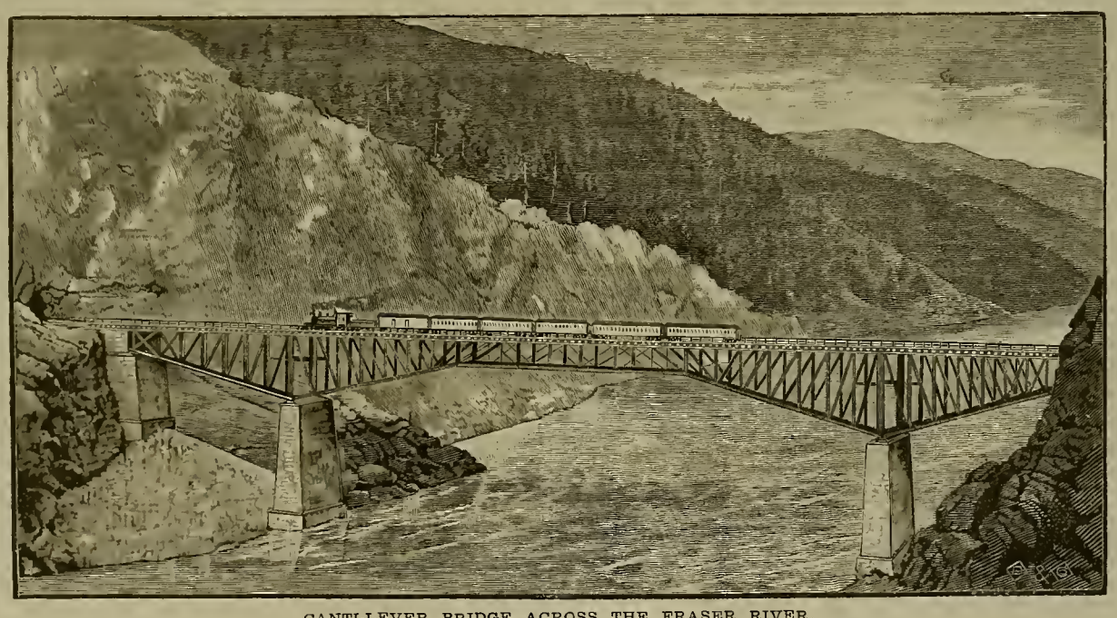
An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, OCTOBER 25, 1884. VOLUME XLIX. Number 17.

Canti-lever Bridge Across the Fraser River.

We place before our readers a view of another of these bridges, which has recently been thrown across Fraser river, below the town of Lytton, carrying the Canadian Pacific Railway. This is the second bridge of this description which has been constructed in the United States, and it is a matter of some interest to Californians to learn that the work was intrusted to Pacific coast engineers, the contract for its erection having been awarded to the San Francisco Bridge Company, of this city. Its construction is represented as one of the greatest feats accomplished in the course of the construction of this important continental railroad. It is also gratifying to learn that the work has been done to the entire satisfaction of Mr. Onderdonk, the general contractor for the road in B. C., and to the managers of the road themselves.

This Company has just completed the contract for all the bridging on the Pacific division of this road, representing 47 spans, at an aggregate cost of over $300,000. Amongst these is the bridge carrying this road over the Pitt river, containing 14 spans of a Howe truss, 2,280 feet long, the piers of which stand in rapid water 48 feet deep, and which, in winter, carries large fields of floating ice. This is the largest bridge west of the Rocky Mountains.



CANTI-LEVER BRIDGE ACROSS THE FRASER RIVER.

The design is what is known as the canti-lever bridge, the principle of which is that of a trussed beam, supported at or near its center, with the arms extending each way, and one end anchored or counterweighed to provide for unequal loading. It is in practice an entirely new design, no other bridge as yet having been completed upon this principle, except the bridge recently erected at Niagara Falls.

Each end is made up of a section, entirely of steel, extending from the shore nearly half way over the chasm. Each section is supported near its center by a strong masonry pier, from which extend two lever arms, one reaching the rocky bluffs, the other extending over the river 109 feet beyond the pier. The outer arm having no support, and being subject like the other to the weight of trains, a counter-advantage is given by the shore arm being firmly anchored to the rocks on the shore. The piers on either side rise from the water's edge; between them a clear span of 315 feet over the river. The ends of the canti-levers reaching on each side 215 feet from the abutments, leave a gap of 100 feet filled by an ordinary truss bridge hung from the ends of the canti-levers. Here provision is made for expansion and contraction by an ingenious arrangement between the ends of the truss bridge and of the canti-levers, allowing the ends to move freely as the temperature changes, but at the same time preserving perfect rigidity against side pressure from the wind. There are no guys for this purpose, as in a suspension bridge, but the structure is complete within itself. The total length of the bridge is 530 feet. It has a single track, and is built strong enough to carry a freight train of the heaviest kind extending the entire length of the bridge, headed by two "consolidation" engines, and under a side pressure of 30 pounds per square foot, which pressure is produced by a wind having a velocity of 75 miles per hour, and even then will be strained to only one-fifth of its ultimate capacity. The foundations rest on the solid rock; two pieces of masonry are carried up 96 feet above the surface of the water, supporting the canti-levers.

The structure has very much the appearance of an ordinary truss bridge, but, in view of the conditions and surroundings, very different in the manner of its erection. The piers on the water's edge and the shore arms of the canti-levers have, of course, been erected with the help of temporary falsework, rendering the erection of the superstructure comparatively easy. But after this comes the difficult portion of the work, *i. e.*, to span the 315 feet across and 135 feet above a roaring river, whose force no earthly power can stay. No temporary structure could survive a moment, and here the skill of the engineer came in to baffle nature and laugh at her powers. The design of the canti-lever is such that after the shore arm is completed and anchored, the river arm is built out, one panel or section at a time, by means of great traveling derricks, and self-sustaining as it progresses. After one panel of 25 feet is built and has its bracing adjusted, the traveling derrick is moved forward and another panel erected. Thus the work progresses, section by section, until the ends of the canti-lever are reached, when a truss bridge is swung across the gap of 100 feet, resting on the ends of the canti-lever arms, thus forming the connecting link. This great work will remain for ages an imperishable monument to the skill, enterprise and energy of the San Francisco Bridge Company.

This great work was carried out to successful completion without loss of life or accident of any kind, under the able supervision of the company's general superintendent, Mr. A. W. Sypott.

Referring to our illustration, we would state that the total length of the bridge is 530 feet, the central span being 315 feet long. The ends of the span rest upon piers of solid masonry, 96 feet high, and containing 6,480 cubic yards of stone. The superstructure contains 1,200,000 pounds, or 6,000 tons of cast steel and iron. The total cost was $280,000. The *West Shore*, of Portland, Or., in speaking of this structure, says: Though the bridge is not so long as the one at Niagara, the difficulty attending its erection was much greater, owing to the fact that the site could be approached from one end only. One-half the material was sent across the river on a steel cable one and one-fourth inches in diameter, several pieces thus transferred weighing over five and a half tons each. In this respect the bridge stands without a parallel in the world. The first iron was placed in position on the 17th of March, and on the 14th of June a train crossed over the completed structure; only 73 days, including those lost by reason of bad weather, were consumed in the transfer of iron across the stream and the erection of the entire bridge. As an example of speed and skill it is without a parallel, when the difficulties to be overcome are considered."

If all the bridges, which the company has constructed on this coast, were placed in line their aggregate length would span a stream eleven miles wide. This company is the largest contracting and engineering firm on the Pacific coast, and their undertakings have been very heavy and quite varied.

The company has also just completed at Roseburg, an iron combination bridge over the Umpqua river, 600 feet long, consisting of two spans of 200 feet each, standing on iron cylinder piers 40 feet high, which is the largest highway bridge in the State of Oregon. They have also under construction six spans of iron combination bridge, on iron piers, over the Los Angeles river, for the city of Los Angeles; and have contracts in various other counties of California, Oregon and British Columbia.

There is another work of this company in British Columbia which is deserving of special mention, because of its superior character, the difficulty attending its erection, and its importance to navigation; the Fraser river lighthouse on the Gulf of Georgia, between Vancouver island and the main land of British Columbia. This lighthouse stands five miles out at sea, and, like the famous Eddystone lighthouse, is always surrounded by a tempestuous sea. For many years the Government deemed it impracticable to erect a lighthouse at that point, and maintained a lightship there; but the enormous expense of so doing led to an effort to erect a lighthouse. A contract was let to the San Francisco Bridge Company by the Dominion Government of Canada, and the work was executed under the immediate supervision of Mr. J. McMullen, president of the company. Over treacherous and shifting sands the iron screw pile foundation is an admirable device for bridge foundations, marine piers and lighthouses. They can be screwed into the bottom to any desired depth, and offering the smallest possible resistance to the waves, make a reliable foundation. This device was adopted and the work performed in the most scientific manner. The lighthouse cost $43,000, and is an imperishable monument to the engineering skill of the contractors.

We take great pleasure in thus calling attention to the engineering achievements of this firm who have their office at No. 10 California street, in this city.

THE Bald Mountain Extension Company cleaned up at Forest City Monday 75 ounces. A two-ounce piece was found in a breast beyond the lava flow, where the gravel is supposed to be rich.

THE National Mining Exposition at Denver, recently closed, is said to have been a financial failure. The exposition of itself was good, but its patronage was disgustingly bad.

THE Big Bend Hydraulic Mining Company paid a dividend of $6,000 on the 6th. This makes $60,000 paid this year.

ANTIMONY is selling in Liverpool at £41 to £42 per ton.

CORRESPONDENCE.

We admit, uncensored, opinions of correspondents. EDS

Mining Around Benton, Mono Co., Cal.

[From our Traveling Correspondent.]

As there is but little prospecting going on at present, aside from the required assessment work in Indian, Clover and other outlying districts, a few words will suffice.

The ledges are represented in the main to be very large for this region, and to contain an immense quantity of rather low grade gold-bearing quartz, estimated by those at work to mill somewhere $10 to $20 per ton. There is every reason to believe that it will be made to pay at no distant day in the future.

Some work is being done on the eastern side of the valley in the vicinity of the somewhat famous Queen Mine, that has turned out in the past upwards of $1,000,000 in bullion, and if reports are true, is still far from being exhausted.

The Reward

Is one of the most promising mines of this neighborhood, showing croppings 100 feet in width, and giving a fine prospect for a large ore body when once fairly opened. A depth of 60 feet from the surface finds the ore lying in seams, each about a foot in width between layers of talcose slate. It is rich silver lead ore, with assays as high as $3,000 per ton. One shipment sometime ago of three tons, second class, netted $250 per ton; and five tons, first class, probably not far from $400, as the gross yield reached $600 per ton. Mr. John Kremkon, of Benton, informs me that he is on the eve of shipping six tons of a similar character to Selby & Co., of your city, for reduction. This lot is expected to yield not less than $500 per ton gross.

The principal mining in the immediate vicinity of Benton is confined, as in the past, to what is generally known as

The Blind Spring Hill.

It has yielded in the gross (assay value) according to a calculation of one of the oldest and most experienced miners of the place, not less than $5,000,000 in bullion. It was taken out, mostly shipped and reduced at a great cost to the owners, when prices for everything were very high and the disadvantages for working were greatest. The mines are ranged along and on each side of a long high ridge 1,200 feet above the bed of the C. & C. R. R. and over 6,000 feet above the sea level. The lodges run nearly north and south with the mountain and usually parallel, more particularly on the eastern slope. The country on the west side interiorly, to all appearances, has undergone in places a greater or less degree of disturbance. The old Comanche lode, running along the center of the ridge, has a slight eastern dip, becoming nearly perpendicular as depth was attained. It is looked upon here as a true fissure vein, as well as one of very great value. All the ledges east of this, dip with a greater or less angle to the east. All on the opposite side are thought to have a western dip, with the exception of one or more which seem, so far as open to view, to have assumed a position as nearly horizontal as possible.

Beginning with mines at present in active operation on the west side, the following report speaks for itself at the date on which it was written:

BENTON, Sept. 27, 1884.

We have been doing a great deal of dead work and putting the mine in shape for the last three months, in order to work it to advantage and for the benefit of the company. We expect to commence taking out ore next week and in a month from now will be able to keep the mill running on $200 rock.

W. H. RUSSELL, Supt. of the Co.

Your correspondent may add that the lode as witnessed, varies in width from 5 inches to 2½ feet. It is understood that the ore, probably selected, has gone much higher than the above estimate of the superintendent. The original location under another name is said to have turned out in the neighborhood of $400,000. A short distance from this mine, Mr. John Tucker is busily at work on

The Eastern Star,

With excellent results and more splendid prospects in anticipation. He has from 2 to 3 feet of very rich ore, all of which is extracted for reduction. Shipments heretofore made reached $228 per ton. He is about to send off 4½ tons, which he fully believes will work over $600 per ton, as the ore is rapidly improving as the exploration of the mine progresses. One large piece of ore now lying before me, weighing 84 pounds, is estimated by the best local experts to work at the rate of $700 per ton, while a smaller specimen, much of it pure horn silver, will go $1 per pound, or at the rate of $2,000 to the ton.

Turning to the eastern slope of Blind Spring Hill, we find Mr. J. F. Millner, of Benton, vigorously prosecuting work on

The Borasca Mine.

It is thought to be valuable property. Like all the lodes of this district, it lies mostly in granite, accompanied in some places with more or less porphyry. One vein averagos two and a half feet. The whole of the contents as taken from mine works from $125 to $150 per ton. First-class assorted ore mills $500 per ton. Thus far about $16,000 have been realized.

Teams are at this writing daily hauling to the 5-stamp mill in Benton of

The Wai Wera M. & M. Co,

Which is expected to start up within a few days. But little has been done for some time by the last named company owing to the cost of hauling wood and water. It has been opened to the depth of 900 feet and has yielded (assay value) on good authority more than $1,500,000.

The *Cornucopia*, next lode east, I believe, has produced about $400,000. Four tons second class taken out last fall, worked $125 per ton and 3 tons first-class $1,099.50 per ton.

The *Comanche*, lying next on the west of the Wai Wera, and mentioned before, supposed by many to be the mother lode of the hill (although at present lying idle), is said to have produced one and a half millions in bullion. Over $300,000 have come from the *Lyford*, and from $1,500 to $2,000 from the *Moran*.

A Grand Project

With the probabilities greatly in favor of its proving a very profitable one, has been for sometime under contemplation and is now awaiting accomplishment at the hands of some energetic capitalist who is willing to share some little risk with the miners of Benton.

It is no less than to start a single track tunnel at the eastern base of the mountain within one-half mile of the C. & C. R. R. track, and run through Blind Spring Hill from east and west, tapping all the ledges in its course, or such as may go down to its level. It would thoroughly drain and divellen all the mines and give easy exit for all the ore for shipment by the railroad or to be worked at mills that may be hereafter erected convenient to the mouth of the tunnel. It will strike the following ledges in the order and at the depth named. The Moran at perpendicular depth of 200 feet, the Lyford at 800 feet the Cornucopia, 1200, the Wai Wera about 1200 and the Comanche at about 1,100 feet owing to a depression in the hill at its location.

A calculation has been made that the cost need not exceed $100,000, which is but a trifle in comparison with the vast treasures that may be very reasonably supposed to yet lie uncovered in this hitherto large storehouse of wealth. A. C. K.

Benton, Mono Co. Cal.

Deadwood, Trinity County.

EDITORS PRESS: I have noticed in your last issue that glowing accounts are being given of outside mining industries beyond the limits of California, and seldom do the public hear of the numerous mines being worked profitably in parts of our own State that deserve more than a passing notice. Should you permit me to trespass on your valuable space I shall try and give you an outline of the mining industry of Deadwood. This camp is located in the eastern part of Trinity county, in the Trinity range of mountains. Its altitude is about 3,000 feet above the level of the sea. A small rivulet wends its way from the foot of these mountains and empties into Trinity river, about five miles from its source. It was mined in early days for the placer gold it contained and yielded handsomely. Quartz mining has been going on here for the last 10 years, the old primitive arastra having made many an honest miner happy.

Recently several mills have been built of small capacities. McDonald Bros. & Co. put up a five stamp mill this summer, and in three months they have cleaned up nearly $100,000. Their ledge is from two to four feet wide, and all yields nearly $200 per ton. They have sunk a shaft 100 feet from their first tunnel, which they drove in the mountain, and the ledge is simply immense all the way down. Other properties in this district are now looming up. George Cloyne has a mill on his mine, and it yields him a splendid profit. Mr. Davidson also is extracting ore for his Cannon Ball mill. Another mill is being constructed by Mr. Murdock. Several others, too numerous to mention, have good properties here, but all of these men are practical miners. They need no capital to help them to put up an arastra, and when they realize enough out of the mine they erect a mill. Another property I forget to mention is Mr. Lapan's. His ledge is about two feet wide, and in some places very rich. He also has discovered two cross ledges, which are running towards the main vein. He is now engaged in extracting ore to run his arastra as soon as the rainy season commences. The general formation of this district is porphyry and slate. All the rock contains a trace of silver, but not enough to notice. It contains no rebellious substances, so that an arastra, or plain gold mill, does the work to perfection. Should such a showing be made as we have here by some of our mining speculators, who try to make a boom where distance lends enchantment, they would have a mining town, mining companies formed, incorporating with capital stock 10 millions, and other Lady Bryan and Alta swindles would come to light, but the days of gambling in mining are over. By working mining properties in a legitimate manner we shall yet bring California to the front as a gold producer. P. F. Mc.

The Concentrator Controversy.

At the request of Adams & Carlin, Pacific Coast agents for the Frue Vanner, we reproduce the following correspondence from the N. Y. *Engineering and Mining Journal:*

In your last issue, there was an article purporting to give results obtained at the Carlisle mill, in New Mexico, in a competition of the above-named machines on the tailings of a gold mill. While not denying that it is *possible* to so run a Frue vanner that a Duncan concentrator would give better results, I am able to give a few facts in regard to the special test quoted, that will be of interest to any one accepting the same as a real comparison of the two machines.

In the first place, the Duncan concentrator is a large pan, which has, according to its maker's description, "two motions—an irregular centrifugal, and an oscillating." The vanner it is not necessary to describe, nor its successful work on finely crushed mineral, as over 200 are at work in California alone on gold mill tailings, and have there replaced all other concentrators in general estimation. During the last 20 years, dozens of pan concentrators have been invented, patented and introduced, and, later, disappeared from view. They are all based on an hydraulic miner's idea of concentration, namely, that a gold pan is the ideal form, whereas all concentrator men, used to dressing slimes and finely crushed mineral, are aware that the gold pan is of little use, even in the most experienced hands, except on gold amalgam. So much as to the probabilities in the case of a test on stamp-mill tailings between a pan machine and a belt machine, when finely divided sulphurets have to saved.

Last fall our Denver agent visited the Carlisle mill, and found the Duncan concentrators in use. The ore was good, the sulphurets rich, and the tailings of the Duncan concentrators were also valuable: The field for improvement was so excellent that Frue vanners were offered on liberal terms to treat the tailings of the Duncan concentrators, and in October an agreement was signed with the Carlisle Mining Company, of which the following extract will convey the substance: "The machines (5) are to be paid for at the rate of ——— (the regular selling price at that time), for five machines, in the following manner: after the said machines are entered in the mill of the party of the first part, at the Carlisle mine, they shall be used to concentrate the tailings from all other machines now used for concentrating in said mill of said company, and the produce therefrom, less $35 per ton, shall be used and appropriated to the payment of such machines, until the said sum of ——— is paid to the party of the second part. And it is mutually agreed by the parties hereto, that if the said machines should not prove satisfactory to the party of the first part, he may at his option return the same by properly packing same and paying the freight on same to Denver, Colorado, or Chicago, Ill., and no payment shall be demanded by the party of the second part, provided that said machines are loaded on cars at Lordsburg, New Mexico, within 40 days from the time said machines are started in said mill."

The power of returning the Frue vanners was thus left entirely with the mining company; but in the final settlement no regard seems to have been paid to the letter of the agreement, our agent apparently being perfectly satisfied with the fact of machines not being returned, and hearing from one of the directors that they were doing exceptionally good work; the members of the company being also known as responsible men. Now, it seems from the article published by you, and contained in a circular distributed by makers of Duncan concentrator, that in a trial of the two machines at the Carlisle mill in the months of *February* and *March*, the Duncan machines proved vastly superior to the vanners. Yet the vanners were never returned by the Carlisle Mining Company, and on *February* 28th three more vanners were ordered from Chicago, and on *April* 7th two more were ordered. Curious result of such a test! especially as the vanners are more expensive to buy than the Duncan.

Two points about the test described may be noted. The value per ton of concentrations is a little higher for the Duncan than for the vanner. Any man who has seen the two machines run will open his eyes at this; and any one who has seen the vanner run will be scientifically interested to find that at last a concentrator has been found that will make sulphurets cleaner than pure. As to amalgam quoted in tests, the vanners were not ordered for saving this, as it was expected the amalgamator would keep it on his coppers; but even if, through occasional carelessness at battery or some special difficulty with ore, amalgam is expected at concentrators, we have long ago found that substituting a copper plate, having ½-inch rillles across top and bottom for ordinary pulp distributor on vanner, made the most effective amalgam concentrator possible to conceive, the shaking motion rolling it into small pellets under the rifles in a form impossible to lose again. For floured quicksilver, as witness the treatment of pan mill tailings, the vanner can not be excelled. On globular quicksilver, we admit being weak; it rolls down the belt when too large; but the mill man who can not save globules of quicksilver without a concentrator should direct his attention to some other business.

We shall be pleased to make a similar agreement as that above mentioned with the Carlisle Company with any mill having stamps, sulphurets that will concentrate a value of at least $100 per ton, and using concentrators of the pan form, in not larger number than the vanners would be employed—say from two to five stamps. Yours truly,

WALTER MCDERMOTT,
General Agent.

Mining in Inyo

In the mountains on both sides of Owens valley, there are hundreds of well-known ledges of gold and silver bearing ores that are not worked. Many of these ledges contain what would in other districts be classed as high grade ores. The claims are mostly owned by poor men, and in this fact the cause is found why the mines are not worked. Discoverers of the ledges were mostly men who had gained their mining experience in the placer claims or free gold quartz mines on the western slope of the Sierra. The same methods they had seen used for extracting gold were tried here but as the ores are entirely different, failure was a necessary result. Some experiments were made to discover a method that would extract the gold or silver from the ore, but for want of sufficient capital, these experiments were not carried far enough, and work on the mines was suspended. Many of the mining claims came into possession of parties in San Francisco and elsewhere, men who had money enough to experiment with, but it would appear that each was waiting for the other to make the experiments. In the mean time these parties maintain their titles to the mines by doing the necessary assessment work, so that they may profit by the boom that is sure to follow the introduction of a successful method of working these ores. It will doubtless be found that many localities which at the present time have received hasty condemnation, and are idle and neglected in consequence of an unfavorable report, will, when a better understanding and knowledge prevails, be opened up and proven of most substantial wealth and value, when their real wealth and methods of working it have been mastered. It is true that a few mines in the country have produced millions of dollars, even with the imperfect means used for the extraction of the metals; but so far in the history of its partial development, it is as if a field which requires the most careful culture should produce a promising crop when no cultivation has been given. It would only be taken as a proof of the natural richness and productiveness of the ground. So the results in the mining history of this county, instead of being taken as a measure of its returns to be expected from its development, should rather be received as an estimate of its probabilities and a proof of its great advantage, because as a matter of fact the result produced have been generally secured without the use of these things which are most necessary to its real and substantial development.— *Inyo Independent.*

Roger's New Steam Quartz Mill.

The new steam quartz mill built Patrick Rogers, at Boston Ravine, started up for regular work yesterday, commencing the crushing of rock from the Crown Point quartz mine. Ground was broken for this mill on the 15th of August and in just seven weeks it was ready for regular operations. The mill stands nearly opposite the mouth of Rhode Island Ravine, and is situated between the main road and Wolf creek, with the fall from the batteries toward the creek. The foundation for the batteries and engine are solid masonry work built 12 feet in hight from the bed-rock. There are two five-stamp batteries with iron mortars, the stamps and stems weighing 800 pounds each. The batteries are fed by two Hendy self-feeders. The amalgamating plates, and the pulp passes from the sluices into Hendy concentrators, and the concentrations are worked through two Knox pans. A complete system of sluices is also connected with the mill, and everything is well and neatly arranged for doing perfect work. The power to drive the mill is an engine with cylinder of 12 inch diameter and 20-inch stroke; the boiler being a 46-inch tubular 16 feet long. The mill building is 22 by 30 feet, and the boiler shed 12 by 30 feet. In front of the batteries and running on a level to the road is a heavy and strong platform upon which to dump the quartz, upon which teams can drive to discharge their loads. Attached to the mill is a large yard for the storage of wood with which to run the engine. The builder of the mill was Jos. A. Evans, who has done much excellent work of this kind in the district. Patrick Rogers, the owner, has superintended the general construction and will superintend the running of the mill. A. Calahan is the engineer and machinist. The mill is intended for custom work, and is well located for that purpose, being central to the mines of the district, and a point to which hauling can be done at the most favorable rates.—*Grass Valley Union.*

THE BULLION product of Tuscarora for the month of September, reaches a grand total of $90,572.58. Of this amount the Najavo shipped $65,072.58, and the Grand Prize $25,50

MECHANICAL PROGRESS.

idden Flaws in Metal.

What really needed, says the *London Builder*, is some system, could such be devised, by which those hidden flaws which the very best metal made by the very best process will sometimes contain, should be rendered patent to the eye of an inspector. Is there any chance of such a system being devised? It is clear that chemical tests are quite useless; they can tell nothing as to the general composition of the metal. Electrical tests may possibly yet be used with effect. They were proposed some years ago and have been revived lately by Prof. Hughes, the inventor of the microphone. With his beautiful instrument, the "magnetic balance," he has proved that in wires or small pieces of iron, almost all peculiarities of the metal, including the existence of flaws, can be detected with ease and certainty. His invention has been freely given to the world, but heretofore the world (as usual) has been wholly indifferent to the gift. So far as we are aware, no railway or marine engineer has taken any steps with a view to ascertain whether a similar system might not be applied to pieces of large size such as those required in actual work. Failing this, mechanical tests in a proper testing machine do not seem impossible. If the axle which broke at Penistone, before having been set to work, had been subjected to a sudden cross-breaking strain, similar to that which caused its destruction, but very much below what it should be able to support with safety, we cannot doubt that the resulting deflection or bending would have been far greater than if the axle had been sound. What we would suggest, therefore, is that all crank axles, or other pieces of metal called to fill equally important positions, should be tested by strains similar to those brought upon them in actual work, and that their deflections under those strains should be recorded. A few experiments would be sufficient to show clearly how great this deflection should be in the case of a sound and perfect axle; and if any specimen showed a deflection decidedly higher than the limit, it should be rejected as a doubtful quality. The expense of such a system would not be great when it once became a regular part of the manufacture of an axle; and it appears to us the only method by which a single faulty specimen can be weeded out from a batch of sound and satisfactory articles.

Making Changes in Machinery.

How easy, says the Boston *Journal of Commerce*, a workman can recommend a change in the working parts of a machine, after everything has been adjusted and left in working order by those who were sent with the machinery from the works of the builder, and how easily he can make the attempt to correct the apparent disorder by making a few slight improvements. Machines have been delivered with full instructions for running them, and been returned for the reason that there were working parts that were left in doubt by some additional improvements. The engine lathe, with a dead center that could be easily removed by running back the spindle with the hand wheel, must be divided for a pin wedge by the lathe man before he finds out that such a thing was not needed. Cutter-heads with the driving spindle have been boxed up and shipped for the purpose of having a collar to guard against an end movement, where the builder had made provisions for this very difficulty by turning V grooves in the bearings of the spindles. And so with the machines for the working of cotton. Some familiar part must be entirely remodeled so as to accord with the ancient idea with which the attendant is more familiar, and often costly attachments may be found laid aside which were intended for a purpose, with the use of which no one was acquainted; and even machines have been fitted for different grades of material by making some additional arrangement in the working of the machine, when all the while provisions were made for this very purpose. When the machinery from a reliable firm will not operate in accordance with the notions of the attendants it would be proper to inform the parties whose interests lie in the proper working of the machine, and let them remove the difficulty, if any exists, and explain some of the mysteries of the one-sided catches that have been made use of, that the production may be benefited as well as the workmen, without discredit to either.

On Working Steel.

A correspondent of the *Blacksmith and Wheelwright* writes that journal as follows: Allow me to express a few thoughts in regard to the degree of heat steel should be worked for edge tools. And in doing so I shall no doubt differ with many, but what of that? If we all had one way of doing work what would be the use in giving *our method*" for doing anything? Some tell that steel should never be heated above a cherry-red, others say it should not be hot enough to scale, and many suppose if heated to a white heat the steel is burnt and is utterly worthless. Now, if all this be true, how in the world can a edge tool ever be made, and of what practical use would they be when they were made.

Can steel be put into an ax or any other tool without heating the steel above a cherry-red heat? If so, I would like to have some one tell me how, as I have never learned that part of the trade. It will be of no use to cite the "cherry heat welding compound," as I have had a box of that in my shop for years, and would be glad to dispose of it at a low price, unless the manufacturer will come and show me how to use it. I do not believe that iron or steel can be welded at a cherry heat.

My experience in the working of steel during the past 15 years has been mostly confined to the ax business. I have made and repaired during this time several hundreds of axes, and the work has given unparalelled satisfaction. My experience in the matter has convinced me that the degree of heat steel should be worked, depends very much upon circumstances. For instance, if I am going to fix over an ax, and wish to reduce the steel to one-half or three-fourths of its present thickness, I have no fears of any bad results if the steel is brought to a white heat to commence with. But when nearly to the acquired thickness, I am careful not to heat above a cherry-red. And when the last or finishing touch is given by the hammer it is at a low heat, when but a faint red is discernible. I never finish forging an edge tool of any kind at a cherry-red heat. The finishing should be done at as low a heat as to refine the steel and leave it bright and glossy. In heating to temper the greatest care should be observed that an even cherry-wood heat is obtained. I do not deny that injury may occur by overheating. This every smith knows to be true; but I *do* claim that it can be remedied, and the fine grain of the steel restored when the nature of the work will admit of a suitable amount of forging. When it will not, I never heat above a cherry-red. Come, friends, let us hear from you on this and other subjects. Supposing we do make blunders and expose our ignorance once in a while. We may become enlighted and do better, as no one is too old to learn.

DIAMOND TURNING TOOLS.—It is sometimes desirable to reduce the dimensions of a hardened steel article that has received a lathe finish without first drawing the temper, as this necessitates a rehardeuing and retempering. The usual method of lathe reducing of hardened steel articles by corundum wheel grinding is necessarily confined to straights or tapers, no offsets, collets, or shoulders being amenable to this style of work. A model maker and bright mechanic has succeeded in utilizing the black diamond, or bort, as a turning tool for hardened steel. He places a crystal in the end of a piece of iron or brass for flat turning, and one on the side of the end, or on a corner of the end, for side or shoulder turning. He has succeeded in doing some good work with these crude-looking tools. The chips taken from the hardened steel are literally chips, not turnings, and are very minute. But viewed under the microscope they are seen to be cut from the hardened steel, and not merely disengaged crystals. One of the specimens of work with these bort tools is a well finished V-thread, about 32 to the inch. Two differing crystals of the diamond were employed to cut and true the thread. An adaptation of bort tools to the planer is evidently possible, and there seems to be no reason why its use might not be extended with economical results in the treatment of hardened steel and of chilled iron.—*Scientific American.*

COVERED AND UNCOVERED BOILERS.—In order to ascertain the degree of advantage obtainable by felting and lagging steam boilers, Mr. B. H. Thwaite has carefully carried out the following experiments on a Bull type of vertical boiler: A definite quantity of water was poured into a vessel of a size sufficient to cover one square foot of plate surface, the vessel being externally lined with wood. The rise in degrees of heat during the hour's exposure was noted. The same weight of water, with identical initial temperature, was then placed for the same time on the surface of the lagging, which consisted of three thicknesses of three-eighths inch felt, covered with one-half inch tongued and grooved battens. On the naked plate it was found that 516·75 heat units per square foot were absorbed by the water; and on the laggard portion only 145·75 units per square foot were given off. This is equivalent to a reduction of wasteful radiation, due to the lagging, of 34 per cent, or with a vertical boiler, say 4 feet in diameter and 9 feet in hight, working for 10 hours, there would be saving, due to the lagging, of at least 70 pounds of coal.

IMPROVEMENTS IN STEAM ENGINES.—A writer in one of the mechanical journals expresses the opinion that, taking the best types of steam engines at the present time, some departures are called for in order to realize still greater efficiency and economy. Among the most important points made by this writer is that of the necessity of increasing the ability of the boiler to withstand pressure without adding to its cost, rather than augment its comparative power; also to decrease the friction of the engine and of the transmission to the point where the useful work is delivered. In addition to these requisites, it is urged that better vacuums should be produced in the condenser, and its cost diminished; the expense of the engine must also be lessened, as well as that of the attendance, alike on engine, boilers and machinery, and of lubrication; and there is likewise a greater degree of durability called for in construction.

SCIENTIFIC PROGRESS.

The Philadelphia Electrical Exhibition.

The International Electrical Exhibition recently given under the direction of the Franklin Institute was, by universal admission, the most valuable and successful exhibition ever undertaken by private enterprise in the United States, when considered from an educational standpoint. The *Journal* of the Institute says of it: "The direct value of the Exhibition as a means of education has been utilized to the highest possible degree. The Board of Public Education of the city of Philadelphia has directed each of the schools of and above the grade of grammar school within its control, to take a day to visit the Exhibition with its teachers, in lieu of a school session; and, in response to invitations sent by the officers of the Exhibition to the directors of schools within a radius of one hundred miles, embracing Eastern Pennsylvania, New Jersey, Delaware and Eastern Maryland, a large number of pupils with their teachers have availed themselves of the opportunity of visiting the Exhibition. To assist to an intelligible study of the machinery and apparatus, a series of "Electrical Primers" was prepared, giving in simple and readily comprehensible language, explanations of the principles, construction and operation of the principal groups of exhibits, and placards were posted conspicuously in the neighborhood of characteristic machines, etc., to identify them by name to those to whom they were unfamiliar. The primers, which were issued and sold at a nominal price, proved their usefulness by an enormous sale.

The educational character of the Exhibition was furthermore pronounced by a series of lectures given twice a week in the large lecture hall. These lectures, which were delivered by men of eminence upon topics related directly or indirectly to the subject of electricity, were listened to by crowded audiences and proved to be highly popular. They will be published in a special volume."

ELECTRICITY A TRUE FLOW AND NOT A MERE VIBRATION.—According to the French *Annals of Chemistry and Physics*, Decharme has instituted some experiments showing a hydrodynamic imitation of electric phenomena. He imitated by liquid or gaseous currents, the principal phenomena of static and dynamic electricity, electromagnetism, electrodynamics, induction, electrochemistry, and even electrophysiology, concludes that electric and magnetic phenomena are similar to hydrodynamic phenomena; in other words that electricity, under the form of an æthereal or ponderable current, is analogous to a liquid current, and, when in a state of tension, resembles a quantity of liquid diffusing in a jet. Electric movement is then a true flow and not a mere vibration. Its equipotential lines may be exactly represented by Lamé's differential equation for the curves of hydraulic level. There are some electric phenomena, however, which appear to be the result of vibratory and gyratory movements; but these movements naturally result from the transformation of wave motion in a continuous current.

IMPORTING AMERICAN GRAPES INTO FRANCE.—Ch. Joly has presented a paper to the *Societe d' Horticulture*, upon the importation of muscat grapes from the United States into France. The grapes were preserved in an aqueous solution of glucose. The attention of the grape growers of France and Algiers is invited to the important consequences which may follow this importation. The United States, outside of their enormous grain trade, have hitherto been limited to the export of fruits prepared by a previous drying, which removes about 28 per cent. of the water that they contain; this operation has the double advantage of diminishing the weight to be transported and of facilitating the preservation of the fruit. M. Joly, while calling attention to the danger of an interference with the French grape trade, urges cultivators to increase their productions as much as possible, chiefly by the rational amelioration of their methods of culture.—*Nature, May 3.*

HATCHING CHICKENS BY ELECTRICITY.—According to *Nature* an interesting experiment in the use of electricity in hatching chickens has recently been tried at Berlin. A basket was provided containing a nest of hay, properly covered and provided underneath with a thick pillow which contained a metallic spiral. A battery of six cells furnished the electricity for warming the spiral, the current passing through a lever regulator. A small thermometer was inserted with the bulb in the nest, and a fine platinum wire soldered to the tube. When the temperature became too high, the mercury would rise and touch the wire, forming a contact which would throw the apparatus out of circuit. When it cooled again the current would be restored and the temperature raised. By this device an approximately even temperature was maintained by which the hatching was perfected.

MAGNESIUM VS. ELECTRIC LIGHT.—It is stated that magnesium bids fair to come into important use as a light producing agent for marine purposes, as it is found that its rays have a greater penetrating power in fogs and mists than even those of the electric light. It may be interesting in this connection to state that M. Gratzel, who has recently obtained a patent for the separation of alkaline metals by electrolysis, has been very successful in the reduction of magnesium. At a late sitting of the *Electrotechnische Verein*, in Berlin, a ball of magnesium, of about 15 centimeters diameter, excited general attention. It was of superb brilliancy, similar to that of silver, and had lost nothing of its lustre since its separation by electrolysis. This preservation is a sign of its chemical purity, and forms a remarkable contrast with the magnesium hitherto obtained, which was always more or less affected by potassium, and consequently easily oxidized, especially in a damp atmosphere.

THE SEA LEVEL.—Of late years automatic instruments—tide gauges—have been used for registering the level of the ocean at stated periods. All the principal European Governments and our own are engaged in these observations and measurements. The French Commission has begun a work of this kind, which, it is said, will surpass anything of the kind hitherto undertaken. In Belgium measurements have been made for 8,477 different locations. The measurements have been made in Holland with the greatest exactness. The level of the north sea has not varied for 250 years. The level of the Baltic is the same as in 1826. An interesting point will soon be determined as to the difference of level between the Baltic and Black seas. The Spanish operations have shown that the Atlantic ocean, at Santander is 0.582 meters above that of the Mediterranean at Alicant.

A NEW GAS BURNER, invented jointly by the late William Siemens and his brother Frederic, has recently been perfected by the latter, and is now known as the "Siemen's regenerative gas burner." The principle of the invention consists in heating to a high degree both the air and gas previous to combustion, the heating being effected by the waste products of the combustion. The great merit of the invention consists in a great increase of illumination with a diminished consumption of gas. It is claimed that with a jet which, burned in the ordinary way, will yield only three or four candle power, will, by the use of this new device, yield a 10-candle light. It is claimed to be a decisive step in advance in the use of gas, and one involving several novel and scientifically correct principles.

ARTIFICIAL GRAPHITE.—According to a French journal, Dr. Aron has exhibited, at the meeting of the Berlin Electrical Society, various specimens of vegetable carbon, which were made conductors and rendered almost incombustible by energetic and prolonged heating in a vacuum or in a neutral atmosphere. These properties are so much like those of graphite that the product may well be called artificial graphite, although it is not crystalline. The experiments show that if, as has been affirmed, the presence of hydrogen in graphite determines its combustibility, this can be true only of combined hydrogen, for carbon which has been calcined and made incandescent in an atmosphere of hydrogen is no more combustible than before.

REMARKABLE PHOTOGRAPHS.—Some remarkable photographs of a pistol bullet in its flight, under the illumination of an electric spark, has been secured by Prof. E. Mach, of Prague. He has also photographed the air streams which one may see over a Bunsen burner placed in sunshine; and has even obtained pictures of *waves of sound.* These last being made visible by a method in which advantage is taken of the irregular refraction of light by the waves set in vibration by sound. Although these experiments may not have any practical value, they are interesting as showing the great degree of perfection to which the photographic art has been carried.

STUDYING THE OYSTER BY TREPANNING.—Bauchon Brandeley, in order to study the embryonic growth of the oyster, perforated the upper shells by means of a trepan. After the hole is made and the particles of the shell carefully removed a stopper is prepared of linen, wax or some other material, to exclude the water and the enemies of the oyster. The shell is reconstructed by a thin layer of pearl in about eight days. In order to prevent the growth being too rapid while the observations are going on, the stopper is turned around every two or three days.—*Les Mondes.*

VOLCANIC INTERRUPTIONS OF TELEPHONES.—New and interesting phenomena are constantly coming to light in connection with the great volcanic disturbance, Krokatoa. A French electrical light journal says that during the eruption telephonic communication was almost impossible in the city of Singapore, which is located 500 miles distant from Krokatoa. On a subterranean cable, of about two miles in length, the words were drowned by a peculiar noise, which sounded like pistol shots. The phenomenon appeared to be of an electric nature, rather than acoustic.

THE SUPPOSED TRANS-NEPTUNIAN PLANET.—Flammarion, who has long been engaged in investigating the probabilities of a trans-Neptunian planet, has published the results of his work. He thinks there is no doubt of its existence and that it will finally be discovered, but not for some years to come; that it will appear as a star of the twelfth magnitude, and quite large enough to be seen and followed by many telescopes now in use.

CORRESPONDENCE.

We admit, uncondorsed, opinions of correspondents.—EDS

Mining Around Benton, Mono Co., Cal.

[From our Traveling Correspondent.]

As there is but little prospecting going on at present, aside from the required assessment work in Indian, Clover and other outlying districts, a few words will suffice.

The ledges are represented in the main to be very large for this region, and to contain an immense quantity of rather low grade gold-bearing quartz, estimated by those at work to mill somewhere $10 to $20 per ton. There is every reason to believe that it will be made to pay at no distant day in the future.

Some work is being done on the eastern side of the valley in the vicinity of the somewhat famous Queeu Mine, that has turned out in the past upwards of $1,000,000 in bullion, and if reports are true, is still far from being exhausted.

The Reward

Is one of the most promising mines of this neighborhood, showing croppings 100 feet in width, and giving a fine prospect for a large ore body when once fairly opened. A depth of 60 feet from the surface finds the ore lying in seams, each about a foot in width between layers of talcose slate. It is rich silver lead ore, with assays as high as $3,000 per ton. One shipment sometime ago of three tons, second class, netted $250 per ton; and five tons, first class, probably not far from $400, as the gross yield reached $600 per ton. Mr. John Kremkon, of Benton, informs me that he is on the eve of shipping six tons of a similar character to Selby & Co., of your city, for reduction. This lot is expected to yield not less than $500 per ton gross.

The principal mining in the immediate vicinity of Benton is confined, as in the past, to what is generally known as

The Blind Spring Hill.

It has yielded in the gross (assay value) according to a calculation of one of the oldest and most experienced miners of the place, not less than $5,000,000 in bullion. It was taken out, mostly shipped and reduced at a great cost to the owners, when prices for everything were very high and the disadvantages for working were greatest. The mines are ranged along and on each side of a long high ridge 1,200 feet above the bed of the C. & C. R. R. and over 6,000 feet above the sea level. The ledges run nearly north and south with the mountain and usually parallel, more particularly on the eastern slope. The country on the west side interiorly, to all appearances, has undergone in places a greater or less degree of disturbance. The old Comanche lode, running along the center of the ridge, has a slight eastern dip, becoming nearly perpendicular as depth was attained. It is looked upon here as a true fissure vein, as well as one of very great value. All the ledges east of this, dip with a greater or less angle to the east. All on the opposite side are thought to have a western dip, with the exception of one or more which seem, so far as open to view, to have assumed a position as nearly horizontal as possible.

Beginning with mines at present in active operation on the west side, the following report speaks for itself at the date on which it was written:

BENTON, Sept. 27, 1884.

We have been doing a great deal of dead work and putting the mine in shape for the last three months, in order to work it to advantage and for the benefit of the company. We expect to commence taking out ore next week and in a month from now will be able to keep the mill running on $200 rock.

W. H. RUSSELL, Supt. of the Co.

Your correspondent may add that the lode as witnessed, varies in width from 5 inches to 2½ feet. It is understood that the ore, probably selected, has gone much higher than the above estimate of the superintendent. The original location under another name is said to have turned out in the neighborhood of $400,000. A short distance from this mine, Mr. John Tucker is busily at work on

The Eastern Star,

With excellent results and more splendid prospects in anticipation. He has from 2 to 3 feet of very rich ore, all of which is extracted for reduction. Shipments heretofore made reached $228 per ton. He is about to scud off 4½ tons, which he fully believes will work over $600 per ton, as the ore is rapidly improving as the exploration of the mine progresses. One large piece of ore now lying before me, weighing 84 pounds, is estimated by the best local experts to work at the rate of $700 per ton, while a smaller specimen, much of it pure horn silver, will go $1 per pound, or at the rate of $2,000 to the ton.

Turning to the eastern slope of Blind Spring Hill, we find Mr. J. F. Millner, of Benton, vigorously prosecuting work on

The Borasca Mine.

It is thought to be valuable property. Like all the lodes of this district, it lies mostly in granite, accompanied in some places with more or less porphyry. One vein averages two and a half feet. The whole of the contents as taken from mine works from $125 to $150 per ton. First-class assorted ore mills $500 per ton. Thus far about $16,000 have been realized.

Teams are at this writing daily hauling to the 5-stamp mill in Benton of

The Wai Wera M. & M. Co.,

Which is expected to start up within a few days. But little has been done for some time by the last named company owing to the cost of hauling wood and water. It has been opened to the depth of 900 feet and has yielded (assay value) on good authority more than $1,500,000.

The *Cornucopia*, next lode east, I believe, has produced about $400,000. Four tons second class taken out last fall, worked $125 per ton and 3 tons first-class $1,099.50 per ton.

The *Comanche*, lying next on the west of the Wai Wera, and mentioned before, supposed by many to be the mother lode of the hill (although at present lying idle), is said to have produced one and a half millions in bullion. Over $300,000 have come from the *Lyford*, and from $1,500 to $2,000 from the *Moran*.

A Grand Project

With the probabilities greatly in favor of its proving a very profitable one, has been for sometime under contemplation and is now awaiting accomplishment at the hands of some energetic capitalist who is willing to share some little risk with the miners of Benton.

It is no less than to start a single track tunnel at the eastern base of the mountain within one-half mile of the C. & C. R. R. track, and run through Blind Spring Hill from east and west, tapping all the ledges in its course, or such as may go down to its level. It would thoroughly drain and divellen all the mines and give easy exit for all the ore for shipment by the railroad or to be worked at mills that may be hereafter erected convenient to the mouth of the tunnel. It will strike the following ledges in the order and at the depth named. The Moran at perpendicular depth of 200 feet, the Lyford at 800 feet the Cornucopia, 1200, the Wai Wera about 1200 and the Comanche at about 1,100 feet owing to a depression in the hill at its location.

A calculation has been made that the cost need not exceed $100,000, which is but a trifle in comparison with the vast treasures that may be very reasonably supposed to yet lie uncovered in this hitherto large storehouse of wealth.

A. C. K.

Benton, Mono Co. Cal.

Deadwood, Trinity County.

EDITORS PRESS:—I have noticed in your last issue that glowing accounts are being given of outside mining industries beyond the limits of California, and seldom do the public hear of the numerous mines being worked profitably in parts of our own State that deserve more than a passing notice. Should you permit me to trespass on your valuable space I shall try and give you an outline of the mining industry of Deadwood. This camp is located in the eastern part of Trinity county, in the Trinity range of mountains. Its altitude is about 3,000 feet above the level of the sea. A small rivulet wends its way from the foot of these mountains and empties into Trinity river, about five miles from its source. It was mined in early days for the placer gold it contained and yielded handsomely. Quartz mining has been going on here for the last 10 years, the old primitive arastra having made many an honest miner happy.

Recently several mills have been built of small capacities. McDonald Bros. & Co. put up a five stamp mill this summer, and in three months they have cleaned up nearly $100,000. Their ledge is from two to four feet wide, and all yields nearly $200 per ton. They have sunk a shaft 100 feet from their first tunnel, which they drove in the mountain, and the ledge is simply immense all the way down. Other properties in this district are now looming up. George Cloyne has a mill on his mine, and it yields him a splendid profit. Mr. Davidson also is extracting ore for his Cannon Ball mill. Another mill is being constructed by Mr. Murdock. Several others, too numerous to mention, have good properties here, but all of these men are practical miners. They need no capital to help them to put up an arastra, and when they realize enough out of the mine they erect a mill. Another property I forgot to mention is Mr. Lapan's. His ledge is about two feet wide, and in some places very rich. He also has discovered two cross ledges, which are running towards the main vein. He is now engaged in extracting ore to run his arastra as soon as the rainy season commences. The general formation of this district is porphyry and slate. All the rock contains a trace of silver, but not enough to notice. It contains no rebellious substances, so that an arastra, or plain gold mill, does the work to perfection. Should such a showing be made as we have here by some of our mining speculators, who try to make a boom where distance lends enchantment, they would have a mining town, mining companies formed, incorporating with capital stock 10 millions, and other Lady Bryan and Alta swindles would come to light, but the days of gambling in mining are over. By working mining properties in a legitimate manner we shall yet bring California to the front as a gold producer.

P. F. Mc.

The Concentrator Controversy.

At the request of Adams & Carlin, Pacific Coast agents for the Frue Vanner, we reproduce the following correspondence from the N. Y. *Engineering and Mining Journal*:

In your last issue, there was an article purporting to give results obtained at the Carlisle mill, in New Mexico, in a competition of the above-named machines on the tailings of a gold mill. While not denying that it is *possible* to so run a Frue vanner that a Duncan concentrator would give better results, I am able to give a few facts in regard to the special test quoted, that will be of interest to any one accepting the same as a real comparison of the two machines.

In the first place, the Duncan concentrator is a large pan, which has, according to its maker's description, "two motions—an irregular centrifugal, and an oscillating." The vanner it is not necessary to describe, nor its successful work on finely crushed mineral, as over 200 are at work in California alone on gold mill tailings, and have there replaced all other concentrators in general estimation. During the last 20 years, dozens of pan concentrators have been invented, patented and introduced, and, later, disappeared from view. They are all based on an hydraulic miner's idea of concentration, namely, that a gold pan is the ideal form, whereas all concentrator men, used to dressing slimes and finely crushed mineral, are aware that the gold pan is of little use, even in the most experienced hands, except on gold amalgam. So much as to the probabilities in the case of a test on stamp-mill tailings between a pan machine and a belt machine, when finely divided sulphurets have to saved.

Last fall our Denver agent visited the Carlisle mill, and found the Duncan concentrators in use. The ore was good, the sulphurets rich, and the tailings of the Duncan concentrators were also valuable. The field for improvement was so excellent that Frue vanners were offered on liberal terms to treat the tailings of the Duncan concentrators, and in October an agreement was signed with the Carlisle Mining Company, of which the following extract will convey the substance: "The machines (5) are to be paid for at the rate of ——— (the regular selling price at that time), for five machines, in the following manner: after the said machines are entered in the mill of the party of the first part, at the Carlisle mine, they shall be used to concentrate the tailings from all other machines now used for concentrating in said mill of said company, and the produce therefrom, less $35 per ton, shall be used and appropriated to the payment of such machines, until the said sum of ——— is paid to the party of the second part. And it is mutually agreed by the parties hereto, that if the said machines should not prove satisfactory to the party of the first part, he may at his option return the same by properly packing same and paying the freight on same to Denver, Colorado, or Chicago, Ill., and no payment shall be demanded by the party of the second part, provided that said machines are loaded on cars at Lordsburg, New Mexico, within 40 days from the time said machines are started in said mill."

The power of returning the Frue vanners was thus left entirely with the mining company; but in the final settlement no regard seems to have been paid to the letter of the agreement, our agent apparently being perfectly satisfied with the fact of machines not being returned, and hearing from one of the directors that they were doing exceptionally good work; the members of the company being also known as responsible men. Now, it seems from the article published by you, and contained in a circular distributed by makers of Duncan concentrator, that in a trial of the two machines at the Carlisle mill in the months of *February* and *March*, the Duncan machines proved vastly superior to the vanners. Yet the vanners were never returned by the Carlisle Mining Company, and on *February* 28th three more vanners were ordered from Chicago, and on *April* 7th two more were ordered. Curious result of such a test! especially as the vanners are more expensive to buy than the Duncan.

Two points about the test described may be noted. The value per ton of concentrations is a little higher for the Duncan than for the vanner. Any man who has seen the two machines run will open his eyes at this; and any one who has seen the vanner run will be scientifically interested to find that at last a concentrator has been found that will make sulphurets cleaner than pure. As to amalgam quoted in tests, the vanners were not ordered for saving this, as it was expected the amalgamator would keep it on his coppers; but even if, through occasional carelessness at battery or some special difficulty with ore, amalgam is expected at concentrators, we have long ago found that substituting a copper plate, having ½-inch rifles across top and bottom for ordinary pulp distributor on vanner, made the most effective amalgam concentrator possible to conceive, the shaking motion rolling it into small pellets under the rifles in a form impossible to lose again. For floured quicksilver, as witness the treatment of pan mill tailings, the vanner can not be excelled. On globular quicksilver, we admit being weak; it rolls down the belt when too large; but the mill man who can not save globules of quicksilver without a concentrator should direct his attention to some other business.

We shall be pleased to make a similar agreement as that above mentioned with the Carlisle Company with any mill having stamps, sulphurets that will concentrate to a value of at least $100 per ton, and using concentrators of the pan form, in not larger number than the vanners would be employed—say from two to five stamps. Yours truly,

WALTER MCDERMOTT,
General Agent.

Mining in Inyo.

In the mountains on both sides of Owens valley, there are hundreds of well-known ledges of gold and silver bearing ores that are not worked. Many of these ledges contain what would in other districts be classed as high grade ores. The claims are mostly owned by poor men, and in this fact the cause is found why the mines are not worked. Discoverers of the ledges were mostly men who had gained their mining experience in the placer claims or free gold quartz mines on the western slope of the Sierra. The same methods they had seen used for extracting gold were tried here but as the ores are entirely different, failure was a necessary result. Some experiments were made to discover a method that would extract the gold or silver from the ore, but for want of sufficient capital, these experiments were not carried far enough, and work on the mines was suspended. Many of the mining claims came into possession of parties in San Francisco and elsewhere, men who had money enough to experiment with, but it would appear that each was waiting for the other to make the experiments. In the mean time these parties maintain their titles to the mines by doing the necessary assessment work, so that they may profit by the boom that is sure to follow the introduction of a successful method of working these ores. It will doubtless be found that many localities which at the present time have received a hasty condemnation, and are idle and neglected in consequence of an unfavorable report, will, when a better understanding and knowledge prevails, be opened up and proven of most substantial wealth and value, when their real wealth and methods of working it have been mastered. It is true that a few mines in the county have produced millions of dollars, even with the imperfect means used for the extraction of the metals; but so far in the history of its partial development, it is as if a field which requires the most careful culture should produce a promising crop when no cultivation has been given. It would only be taken as a proof of the unusual richness and productiveness of the ground. So the results in the mining history of this county, instead of being taken as a measure of the returns to be expected from its development, should rather be received as an estimate of its probabilities and a proof of its great advantage, because as a matter of fact the results produced have been generally secured without the use of these things which are most necessary to its real and substantial development.—*Inyo Independent*.

Roger's New Steam Quartz Mill.

The new steam quartz mill built by Patrick Rogers, at Boston Ravine, started up for regular work yesterday, commencing on a crushing of rock from the Crown Point quartz mine. Ground was broken for this mill on the 15th of August and in just seven weeks it was ready for regular operations. The mill stands nearly opposite the mouth of Rhode Island Ravine, and is situated between the main road and Wolf creek, with the fall from the batteries toward the creek. The foundations for the batteries and engine are solid mason work built 12 feet in hight from the bed-rock. There are two five-stamp batteries with iron mortars, the stamps and stems weighing 800 pounds each. The batteries are fed by two Hendy self-feeders. The aprons to the batteries are covered with silver amalgamating plates, and the pulp passes from the sluices into Hendy concentrators, and the concentrations are worked through two Knox pans. A complete system of sluices is also connected with the mill, and everything is well and neatly arranged for doing perfect work. The power to drive the mill is an engine with cylinder of 12 inch diameter and 20 inch stroke; the boiler being a 40-inch tubular 16 feet long. The mill building is 22 by 80 feet, and the boiler shed 12 by 30 feet. In front of the batteries and running on a level to the road is a heavy and strong platform upon which to dump the quartz, upon which teams can drive to discharge their loads. Attached to the mill is a large yard for the storage of wood with which to run the engine. The builder of the mill was Jos. A. Everett, who has done much excellent work of this kind in the district. Patrick Rogers, the owner has superintended the general construction and will superintend the running of the mill. M. Calahan is the engineer and machinist. The mill is intended for custom work, and is well located for that purpose, being central to the mines of the district, and a point to which hauling can be done at the most favorable rates.—*Grass Valley Union*.

THE BULLION product of Tuscarora for the month of September, reaches a grand total of $90,572.58. Of this amount the Najavo shipped $65,072.58, and the Grand Prize $25,500.

MECHANICAL PROGRESS.

Hidden Flaws in Metal.

What is really needed, says the *London Builder*, is some system, could such be devised, by which those hidden flaws which the very best metal made by the very best process will sometimes contain, should be rendered patent to the eye of an inspector. Is there any chance of such a system being devised? It is clear that chemical tests are quite useless; they can tell nothing but the general composition of the metal. Electrical tests may possibly yet be used with effect. They were proposed some years ago, and have been revived lately by Prof. Hughes, the inventor of the microphone. With his beautiful instrument, the "magnetic balance," he has proved that in wires or small pieces of iron, almost all peculiarities of the metal, including the existence of flaws, can be detected with ease and certainty. His invention has been freely given to the world, but heretofore the world (as usual) has been wholly indifferent to the gift. So far as we are aware, no railway or marine engineer has taken any steps with a view to ascertain whether a similar system might not be applied to pieces of large size, such as those required in actual work. Failing this, mechanical tests in a proper testing machine do not seem impossible. If the axle which broke at Penistone, before having been set to work, had been subjected to a sudden cross-breaking strain, similar to that which caused its destruction, but very much below what it should be able to support with safety, we cannot doubt that the resulting deflection or bending would have been far greater than if the axle had been sound. What we would suggest, therefore, is that all crank axles, or other pieces of metal called to fill equally important positions, should be tested by strains similar to those brought upon them in actual work, and that their deflections under those strains should be recorded. A few experiments would be sufficient to show clearly how great this deflection should be in the case of a sound and perfect axle; and if any specimen showed a deflection decidedly higher than the limit, it should be rejected as a doubtful quality. The expense of such a system would not be great when it once became a regular part of the manufacture of an axle; and it appears to us the only method by which a single faulty specimen can be weeded out from a batch of sound and satisfactory articles.

Making Changes in Machinery.

How easily, says the Boston *Journal of Commerce*, a workman can recommend a change in the working parts of a machine, after everything has been adjusted and left in working order by those who were sent with the machinery from the works of the builder, and how easily he can make the attempt to correct the apparent disorder by making a few slight improvements. Machines have been delivered with full instructions for running them, and been returned for the reason that there were working parts that were left in doubt by some additional improvements. The engine lathe, with a dead center that could be easily removed by running back the spindle with the hand wheel, must be drilled for a pin wedge by the lathe man before he finds out that such a thing was not needed. Cutter-heads with the driving spindle have been boxed up and shipped for the purpose of having a collar to guard against an end movement, where the builder had made provisions for this very difficulty by turning V grooves in the bearings of the spindles. And so with the machinss for the working of cotton. Some familiar part must be entirely remodeled so as to accord with the ancient idea with which the attendant is more familiar, and often costly attachments may be found laid aside which were intended for a purpose, with the use of which no one was acquainted; and even machines have been fitted for different grades of material, by making some additional arrangement in the working of the machine, when all the while provisions were made for this very purpose. When the machinery from a reliable firm will not operate in accordance with the notions of the attendants it would be proper to inform the parties whose interests lie in the proper working of the machine, and let them remove the difficulty, if any exists, and explain some of the mysteries of the one-sided catches that have been made use of, that the production may be benefited as well as the workmen, without discredit to either.

On Working Steel.

A correspondent of the *Blacksmith and Wheelwright* writes that journal as follows: Allow me to express a few thoughts in regard to the degree of heat, steel should be worked for edge tools. And in doing so I shall no doubt differ with many; but what of that? If we all had one way of doing work what would be the use in giving "*our method*" for doing anything? Some tell us that steel should never be heated above a cherry-red, others say it should not be hot enough to scale, and many suppose if heated to a white heat the steel is hurnt and is utterly worthless. Now, if all this be true, how in the world can an edge tool ever be made, and of what practical use would they he when they *were* made?

Can steel be put into an ax or any other tool without heating the steel above a cherry-red heat? If so, I would like to have some one tell me how, as I have never learned that part of the trade. It will be of no use to cite the "cherry heat welding compound," as I have had a box of that in my shop for years, and would be glad to dispose of it at a low price, unless the manufacturer will come and show me how to use it. I do not believe that iron or steel can be welded at a cherry heat.

My experience in the working of steel during the past 15 years has been mostly confined to the ax business. I have made and repaired during this time several hundreds of axes, and the work has given unparalelled satisfaction. My experience in the matter has convinced me that the degree of heat steel should be worked, depends very much upon circumstances. For instance, if I am going to fix over an ax, and wish to reduce the steel to one-half or three-fourths of its present thickness, I have no fears of any bad results if the steel is brought to a white heat to commence with. But when nearly to the acquired thickness, I am careful not to heat above a cherry-red. And when the last or finishing touch is given by the hammer it is at a low heat, when but a faint red is discernible. I never finish forging an edge tool of any kind at a cherry-red heat. The finishing should be done at as low a heat as to refine the steel and leave it bright and glossy. In heating to temper the greatest care should be observed that an even cherry-wood heat is obtained. I do not deny that injury may occur by overheating. This every smith knows to be true; but I *do* claim that it can be remedied, and the fine grain of the steel restored when the nature of the work will admit of a suitable amount of forging. When it will not, I never heat above a cherry-red. Come, friends, let us hear from you on this and other subjects. Supposing we do make blunders and expose our ignorance once in a while. We may become enlighted and do better, as no one is too old to learn.

DIAMOND TURNING TOOLS.—It is sometimes desirable to reduce the dimensions of a hardened steel article that has received a lathe finish without first drawing the temper, as this necessitates a rehardening and retempering. The usual method of lathe reducing of hardened steel articles by corundum wheel grinding is necessarily confined to straights or tapers, no offsets, collets, or shoulders being amenable to this style of work. A model maker and bright mechanic has succeeded in utilizing the black diamond, or bort, as a turning tool for hardened steel. He places a crystal in the end of a piece of iron or brass for flat turning, and one on the side of the end, or on a corner of the end, for side or shoulder turning. He has succeeded in doing some good work with these crude-looking tools. The chips taken from the hardened steel are litsrally chips, not turnings, and are very minute. But viewed under the microscope they are seen to be cut from the hardened steel, and not merely disengaged crystals. One of the specimens of work with these bort tools is a well finished V-thread, about 32 to the inch. Two differing crystals of the diamond were employed to cut and true the thread. An adaptation of hort tools to the planer is evidently possible, and there seems to be no reason why its use might not be extended with economical results in the treatment of hardened steel and of chilled iron.—*Scientific American.*

COVERED AND UNCOVERED BOILERS.—In order to ascertain the degree of advantage obtainable by felting and lagging steam boilers, Mr. B. H. Thwaite has carefully carried out the following experimeuts on a Bull type of vertical boiler: A definite quantity of water was poured into a vessel of a size sufficient to cover one square foot of plate surface, the vessel being externally lined with wood. The rise in degrees of heat during the hour's exposure was noted. The same weight of water, with identical initial temperature, was then placed for the same time on the surface of the lagging, which consisted of three thicknesses of three-eighths inch felt, covered with one-half inch tongued and grooved battens. On the naked plate it was found that 516·75 heat units per square foot were absorbed by the water; and on the laggard portion only 145·75 units per square foot were given off. This is equivalent to a reduction of wasteful radiation, due to the lagging, of 34 per cent, or with a vertical boiler, say 4 feet in diameter and 9 feet in hight, working for 10 hours, there would be saving, due to the lagging, of at least 70 pounds of coal.

IMPROVEMENTS IN STEAM ENGINES.—A writer in one of the mechanical journals expresses the opinion that, taking the best types of steam engines at the present time, some departures are called for in order to realize still greater efficiency and economy. Among the most important points made by this writer is that of the necessity of increasing the ability of the boiler to withstand pressure without adding to its cost, rather than augment its comparative power; also to decrease the friction of the engine and of the transmission to the point where the useful work is delivered. In addition to these requisites, it is urged that better vacuums should be produced in the condenser, and its cost diminished; the expense of the engine must also be lessened, as well as that of the attendance, alike on engine, boilers and machinery, and of lubrication; and there is likewise a greater degree of durability called for in construction.

SCIENTIFIC PROGRESS.

The Philadelphia Electrical Exhibition.

The International Electrical Exhibition recently given under the direction of the Franklin Institute was, by universal admission, the most valuable and successful exhibition ever undertaken by private enterprise in the United States, when considered from an educational standpoint. The *Journal* of the Institute says of it: "The direct value of the Exhibition as a means of education has been utilized to the highest possible degree. The Board of Public Education of the city of Philadelphia has directed each of the schools of and above the grade of grammar school within its control, to take a day to visit the Exhibition with its teachers, in lieu of a school session; and, in response to invitations sent by the officers of the Exhibition to the directors of schools within a radius of one hundred miles, embracing Eastern Pennsylvania, New Jersey, Delaware and Eastern Maryland, a large number of pupils with their teachers have availed themselves of the opportunity of visiting the Exhibition. To assist to an intelligible study of the machinery and apparatus, a series of "Electrical Primers" was prepared, giving in simple and readily comprehensible language, explanations of the principles, construction and operation of the principal groups of exhibits, and placards were posted conspicuously in the neighborhood of characteristic machines, etc., to identify them by name to those to whom they were unfamiliar. The primers, which were issued and sold at a nominal price, proved their usefulness by an enormous sale.

The educational character of the Exhibition was furthermore pronounced by a series of lectures given twice a week in the large lecture hall. These lectures, which were delivered by men of eminence upon topics related directly or indirectly to the subject of electricity, were listened to by crowded audiences and proved to be highly popular. They will be published in a special volume."

ELECTRICITY A TRUE FLOW AND NOT A MERE VIBRATION.—According to the French *Annals of Chemistry and Physics*, Decharme has instituted some experiments showing a hydrodynamic imitation of electric phenomena. He imitated by liquid or gaseous currents, the principal phenomena of static and dynamic electricity, electromagnetism, electrodynamics, induction, electrochemistry, and even electrophysiology, concludes that electric and magnetic phenomena are similar to hydrodyuamic phenomena; in other words that electricity, under the form of an æthereal or ponderable current, is analogous to a liquid current, and, when in a state of tension, resembles a quantity of liquid diffusing in a jet. Electric movement is then a true flow and not a mere vibration. Its equipotential lines may be exactly represented by Lame's differential equation for the curves of hydraulic level. There are some electric phenomena, however, which appear to be the result of vibratory and gyratory movements; but these movements naturally result from the transformation of wave motion in a continuous current.

IMPORTING AMERICAN GRAPES INTO FRANCE.—Ch. Joly has presented a paper to the *Societe d' Horticulture*, upon the importation of muscat grapes from the United States into France. The grapes were preserved in an aqueous solution of glucose. The attention of the grape growers of France and Algiers is invited to the important consequences which may follow this importation. The United States, outside of their enormous grain trade, have hitherto been limited to the export of fruits prepared by a previous drying, which removes about 28 per cent. of the water that they contain; this operation has the double advantage of diminishing the weight to be transported and of facilitating the preservation of the fruit. M. Joly, while calling attention to the danger of an interference with the French grape trade, urges cultivators to increase their productions as much as possible, chiefly by the rational amelioration of their methods of culture.—*Nature, May 3.*

HATCHING CHICKENS BY ELECTRICITY.—According to *Nature* an interesting experiment in the use of electricity in hatching chickens has recently been tried at Berlin. A basket was provided containing a nest of hay, properly covered and provided underneath with a thick pillow which contained a metallic spiral. A battery of six cells furnished the electricity for warming the spiral, the current passing through a lever regulator. A small thermometer was inserted with the bulb in the nest, and a fine platinum wire soldered to the tube. When the temperature became too high, the mercury would rise and touch the wire, forming a contact which would throw the apparatus out of circuit. When it cooled again the current would be restored and the temperature raised. By this device an approximately even temperature was maintained by which the hatching was perfected.

MAGNESIUM VS. ELECTRIC LIGHT.—It is stated that magnesium bids fair to come into important use as a light producing agent for marine purposes, as it is found that its rays have a greater penetrating power in fogs and mists than even those of the electric light. It may be interesting in this connection to state that M. Gratzel, who has recently obtained a patent for the separation of alkaline metals by electrolysis, has been very successful in the reduction of magnesium. At a late sitting of the *Electrotechnische Verein*, in Berlin, a ball of magnesium, of about 15 centimeters diameter, excited general attention. It was of superb brilliancy, similar to that of silver, and had lost nothing of its lustre since its separation by electrolysis. This preservation is a sign of its chemical purity, and forms a remarkable contrast with the magnesium hitherto obtained, which was always more or less affected by potassium, and consequently easily oxidized, especially in a damp atmosphere.

THE SEA LEVEL.—Of late years automatic instruments—tide gauges—have been used for registering the level of the ocean at stated periods. All the principal European Governments and our own are engaged in these observations and measurements. The French Commission has begun a work of this kind, which, it is said, will surpass anything of the kind hitherto undertaken. In Belgium measurements have been made for 8,477 different locations. The measurements have been made in Holland with the greatest exactness. The level of the north sea has not varied for 250 years. The level of the Baltic is the same as in 1826. An interesting point will soon be determined as to the difference of level between the Baltic and Black seas. The Spanish operations have shown that the Atlantic ocean, at Santander is 0.582 meters above that of the Mediterranean at Alicant.

A NEW GAS BURNER, invented jointly by the late William Siemens and his brother Frederic, has recently been perfected by the latter, and is now known as the "Siemen's regenerative gas burner." The principle of the invention consists in heating to a high degree both the air and gas previous to combustion, the heating being effected by the waste products of the combustion. The great merit of the invention consists in a great increase of illumination with a diminished consumption of gas. It is claimed that with a jet which, burned in the ordinary way, will yield only three or four candle power, will, by the use of this new device, yield a 10-candle light. It is claimed to be a decisive step in advance in the use of gas, and one involving several novel and scientifically correct principles.

ARTIFICIAL GRAPHITE.—According to a French journal, Dr. Aron has exhibited, at the meeting of the Berlin Electrical Society, various specimens of vegetable carbon, which were made conductors and rendered almost incombustible by energetic and prolonged heating in a vacuum or in a neutral atmosphere. These properties are so much like those of graphite that the product may well be called artificial graphite, although it is not crystalline. The experiments show that if, as has been affirmed, the presence of hydrogen in graphite determines its combustibility, this can be true only of combined hydrogen, for carbon which has been calcined and made incandescent in an atmosphere of hydrogen is no more combustible than before.

REMARKABLE PHOTOGRAPHS.—Some remarkable photographs of a pistol bullet in its flight, under the illumination of an electric spark, has been secured by Prof. E. Mach, of Prague. He has also photographed the air streams which one may see over a Bunsen burner placed in sunshine; and has even obtained pictures of *waves of sound*. These last being made visible by a method in which advantage is taken of the irregular refraction of light by the waves set in vibration by sound. Although these experiments may not have any practical value, they are interesting as showing the great degree of perfection to which the photographic art has been carried.

STUDYING THE OYSTER BY TREPANNING.—Bauchon Brandeley, in order to study the embryonic growth of the oyster, perforated the upper shells by means of a trepan. After the hole is made and the particles of the shell carefully removed a stopper is prepared of linen, wax or some other material, to exclude the water and the enemies of the oyster. The The shell is reconstructed by a thin layer of pearl in about eight days. In order to prevent the growth being too rapid while the observations are going on, the stopper is turned around every two or three days.—*Les Mondes.*

VOLCANIC INTERRUPTIONS OF TELEPHONES.—New and interesting phenomena are constantly coming to light in connection with the great volcanic disturbance, Krokatoa. A French electrical light journal says that during the eruption telephonic communication was almost impossible in the city of Singapore, which is located 500 miles distant from Krokatoa. On a subterranean cable, of about two miles in length, the words were drowned by a peculiar noise, which sounded like pistol shots. The phenomenon appeared to be of an electric nature, rather than acoustic.

THE SUPPOSED TRANS-NEPTUNIAN PLANET.—Flammarion, who has long been engaged in investigating the probabilities of a trans-Neptunian planet, has published the results of his work. He thinks there is no doubt of its existence and that it will finally be discovered, but not for some years to come; that it will appear as a star of the twelfth magnitude, and quite large enough to be seen and followed by many telescopes now in use.

MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO:
Saturday Morning, Oct. 25, 1884.

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Passing Events.

The completion of the station on the 3300 foot level at the north end of the Comstock marks an era, as the cross-cutting now commenced there is at a greater depth than any similar work in any part of the world.

The reports which have been received of late from the Little Rocky mines, in Montana, are not so rose-colored as at first. On the other hand, reports this week from the Coeur d'Alene region, in Idaho, appear highly colored. A dispatch in another column gives a statement of enlarged yield of late.

No news of special importance comes from any of the other mining camps of the coast this week. The winter will soon set in in earnest, and in the more mountainous regions the prospectors have already had to come into camp.

THE WATER MILL PROPOSITION.—Regarding the proposition to bring water from the mountain to use as a motive power on the cañyons leading from the Comstock, a mining engineer has estimated that 50 inches in the canyon, carefully flumed and used on the hydraulic principle, giving about 200 feet pressure to each wheel, will furnish enough power to reduce 300 tons of ore per day between this city and the Carson river.—*Virginia Enterprise.*

A New Electric Gold Saver.

Some complete trials of a machine known as the Otto Gold Saver have been made recently at Parker's Pyrites Works, in Melbourne, Victoria. The apparatus consists of a bath of mercury, through which a current of electricity is conducted. As soon as the water flows from the mill through the mercury trough and beneath the carbon slabs, the circuit is complete. It is claimed for the Otto invention that it makes the mercury practically a gold magnet, the electricity being applied in the opposite way to that described as being the Barke method, the electric current through the positive being in direct contact with the mercury, by a platinum point at the bottom of the mercury tray, connected by a wire conductor to the electric generator or dynamis, the negative being above the mercury, the wire conductor being connected with the carbon slabs and also with the electric generator.

The effect is that the mercury is galvanized, and becomes, as it were, a gold magnet, and the water repels or rejects the gold, however fine, and as it flows away leaves the gold behind it in the mercury, which always remains bright, and, no matter how charged with gold, continues to exercise its galvanic or magnetic action on all gold that is contained in the water or crushed quartz that comes from the mill.

It has yet to be proved what can be done, if anything, with pyrites that have neither been burned or ground. Probably one operation will be saved, but, apart from dealing with pure pyrites, the result from saving all free gold, and preventing its loss by preserving the mercury from the destructive effects of the sulphur, arsenic, and other injurious substances, whilst at the same time quickening its amalgamating property and giving it new and more powerful attractive energy for gold, must produce some extraordinary result.

Mr. John Beunet, a mining engineer of Melbourne, Victoria, sends us the following description of the plant and the trials:

The working plant consists of a dynamo electric generator and a bath of mercury right across the table, eight inches wide, with two carbon slabs, and at the entrance of the water and substance, the other carbon slab at the outlet, each eight inches wide, to which the wire is connected from the negative pole of the battery. That is, a wire connected to each and then each to the leading wire from the generator. The positive pole is connected to a wire underneath the bath to the platina point extending into the mercury. The trials were as follows:

1st.—Six hundred pounds of tailings from a Chile mill, that was ground to a pulp, having been put through three times, from which there was six dwts. of gold and ten ounces of mercury received.

Three hundred pounds of antimony ore put through the mill run, from which three dwts. eight grains of gold was recovered, and the mercury quite bright and none lost.

Twelve hundred and eighty pounds of tailings from one of the best mills in the colony, and after passing through concentrating tables, was put through, from which fifteen grains of gold was got and nine ounces of mercury. The pyrites from same are now being tried or passed the Otto gold saver in its pure state, to ascertain what gold it will save from it. I personally believe it will have to be calcined, or rather roasted, before the whole of the gold will be got from it. Even then it is a fine thing. I have no interest in this, the Otto gold saver, only, being an old millman and miner, I am highly pleased with it so far.

CHINAMEN have been swindling gold dust buyers in Sierra county with bogus gold dust. One of the Nevada county papers says that the buyers of gold dust have degenerated of late years. In former times a buyer could not only tell the assay value of gold dust at a glance, but could name the district and even gulch from which the gold was taken.

The Bodie *Free Press* says that from that place there is a steady migration, by stage and private conveyance via the Sonora route that would strike one as a move liable to depopulate the town. But it may be considered for the best as it foretells a simmering down to a practical basis and the employment of all who remain.

Ores of Cobalt.

The chief ores of cobalt are the arsenides and sulphursenides, and their commercial value depends not only on the amount of cobalt present in the ores, but also upon their freedom from other metals, with the exception of nickel which should be present in sufficient quantity to render its separation profitable. Arsenical cobalt, tin-white cobalt or smaltine is the most abundant ore of cobalt; it is tin-white in color inclining in its massive form to steel gray. It crystallizes on the regular system, has a grayish black streak, is brittle, breaking with a granular uneveu fracture and tarnishes by exposure to air; before the blow pipe it emits copious arsenical fumes, and fuses but with difficulty.

This ore occurs in Saxony, Bohemia, Prussia and Sweden, where it accompanies silver, bismuth and copper, and it occurs in Cornwall also. It is found too in Gunnison county, Colorado, at the mines of the Sterling Mining Co., an analysis by Dr. W. W. Iles showing 11.59 per cent of cobalt.

In the United States cobalt is found associated with the ores of nickel, sometimes with those of copper. At Silver Islet the mineral macfarlinite, found with the silver ores, yields a small percentage of cobalt. In Missouri, at mine La Motte, and at the St. Joe lead mines, nickel and cobalt bearing minerals are found associated with the galeua; the nickel in the form of millesite with a small amount of cobalt and the cobalt as sicgenite in brilliant octahedral crystals. At the Gap mine, Lancaster county, Penn., cobalt is found replacing part of the iron in the pyrohotite; the percentage is very small and the ore could not be worked for cobalt alone. Some of the copper ores of Western Nevada also contain cobalt, and it is found in many of the iron ores of Pennsylvania and Virginia. The speiss formed in smelting certain Utah lead ores also contains appreciable quantities of cobalt.

No American ore is worked for cobalt alone, the small amount produced in this country, being obtained as a by-product in the reduction of the worked ores of the Gap mine. At mine La Motte, the cobalt is obtained in a matte produced in smelting the lead ores, the matte being shipped to England and Germany for reduction. The production of cobalt oxide in the United States is very limited, and no other preparation of the metal is produced. Until recently all that was used was exported, and the oxide is only produced incidentally in the reduction of the worked ores of the Gap mine in Pennsylvania.

Cobalt glance, silver-white cobalt or cobaltine, is a native sulphursenide of cobalt, corresponding in composition to the analagous ore of iron, known as mispickel. Cobaltine is silver-white in color, but having a reddish hue; it has a metallic luster, is brittle, and its streak is greyish black; it occurs crystallized in the regular or cubic system. The smalts of commerce are largely prepared from the ore.

Cobalt pyrites or linnaeite is a sulphide of cobalt, having a steel gray or white color, with a yellowish tinge. It occurs in Sweeden and in Prussia.

Earthy cobalt is a variety of "wad" or earthy manganese ore, but which contains cobalt.

Cobalt bloom, erytherine or cohalt mica is a hydrated arsenate of cobalt, which occurs of various shades of red, grey and greeu, with a peach-blossom colored streak. The earthy variety is a peach-blossom color, and is an arsenate of cobalt containing free arseneous acid. This ore occurs in compact uniform masses, or as an incrustation or other minerals, and is generally associated with lead, silver and other cobalt ores.

THE decline in the mining industry is said to be having a marked effect on the prosperity of the city of Denver. Colorado is meeting with the experience of California and Nevada, and the days of wild gambling in mining stocks are among those of the past. They will settle down in Colorado to legitimate mining and form big stock companies after a while, for there are plenty of good miners there as a basis.

THE Borax Works of Wm. T. Coleman & Co. have stopped operations on the Amargosa mines, and have taken their forces to Furniss creek, in Death valley, where they are putting in works to crystallize a much larger quantity of refined borax than formerly.

Copper.

We recently spoke of England as a copper market and of the immense quantities she imported annually. At that time we had no figures at hand to show this year's business. The bulk of her copper comes from Chili, and the United States stands second. For the first nine months this year the imports of copper from Chili to Liverpool, Swansea and London, aggregate 22,628 tons of fine copper; and from all countries these ports have received 62,736 tons in all.

To show the sources of supply, we append the following—which shows the imports to Swansea and Liverpool for the first nine months of this year:

	Tons.
Chili	22,628
United States	12,752
Canada	266
Mexico	254
Peru	223
River Platte	105
New Quebrada	2,753
Newfoundland	224
Spain	2,344
Portugal	230
Italy	533
Norway	235
Cape of Good Hope	4,177
Australia	419
Sundries	236
Precipitates	7,601
	55,100

These figures show the tons of fine copper—not ore alone. In addition, 7,636 tons came to London, making for these ports 62,736 tons. These figures show an increase over the imports of last year of over 7,000 tons of fine copper.

The Chile exports for the year so far, up to the 1st inst., equal 34,098 tons fine. The stocks of Chile produce on hand are equal to 22,516 tons fine. Stocks of other than Chile produce are 9,147 tons, and there are afloat 9,153 tons from Chile and 1,200 tons from Australia. The total visible supply is therefore 42,016 tons of fine copper. James Lewis and Son's, Liverpool, report of ores and metals states that the consumption of copper in and export from England continues on a most extraordinary scale, the deliveries for the past nine months having been 14,965 tons greater than last year, and 20,462 tons more than in 1882. The visible supply at present is 8,851 tons less than on the 1st of October, 1883, when values were £9 higher and 20,650 tons less than in 1880, when values were £6 per ton higher.

Transactions in furnace material have been on a moderete scale, but the large quantities of American ore and matte constantly arriving in England, nearly all of which was sold some time ago, have kept smelters well supplied.

Ten thousand tons (2,000 lbs.) of Lake Superior copper were sold by the Lake companies on the 8th ultimo to American manufacturers, for delivery over the remainder of the year at 13 cents per pound, equal to £60 12s 6d per ton of 2,240 lbs., without discount or commission. The production of the Lake Superior mines in August was 2,633 tons (2,240 lbs.), equal to about 1,974 tons fine against 2,188 tons in July. For the first eight months of this year it has been 17,112 tons fine of 2,240 lbs., and allowing 8,000 tons for the remaining four months, the total production promises to be about 25,000 tons fine. In estimates recently put forward, it is given as 70,000,000 lbs., or 31,000 tons, which evidently refers to the quantity of mineral produced, and which contains about 75 per cent of copper, equal to about 23,000 tons fine—a discrepancy of some 8,000 tons.

The shipments of ore and matte from Montana in August are given as 7,150 tons, representing about 2,400 tons fine, or the same as the previous month. The quantity of American copper to arrive in England during the next three months will probably be much less than anticipated. In Liverpool the variations in the value of Chile bars during the month of September have been confined within the narrow range of 10s per ton. The consumptive demand has been large, but speculation has been quite dormant. The stock of Chile bar is now unusually small—21,768 tons against 26,072 tons on the 1st of January, and they consequently command a comparatively high price. The latest Liverpool quotations are: Chile bars of good ordinary brands, £54 2s 6d per ton, sharp net cash; £54 7s 5d usual terms, and £54 12s 6d three months prompt. Australian £60 for Burra; £61 for Wallaroo cake. English tough, £56 10s to £58; best select £58 10s to £60 per ton, loss 2½ per cent discount. Ore of 25 per cent, 10s 3d per unit; Chile regulus, 10s 7½d per unit in September.

The Discoverer of Gold in California.

A Sketch of the Career of James Wilson Marshall.

James Wilson Marshall was the first discoverer of gold in California, and his name is inseparably connected with the history of this State. For the accompanying engraving of Mr. Marshall and the sketch of his life, we are indebted to the courtesy of the Sacramento *Bee*. Mr. Marshall was born in Hope Township, Hunterdon county, New Jersey, in 1812. He learned the trade of a coach and wagon builder, but his early life presents no features of particular interest. When he arrived at the age of 21 years he caught what is still known in the East as the "Western fever," and he journeyed first to Indiana, then to Illinois, and finally to the Platt Purchase, near Fort Leavenworth, Kansas. Here he purchased a farm, and was prospering, when he was attacked with malaria, and after struggling with the disease for some years, he was told by his physician that he must leave that location if he wished to live.

Just at that time people had begun to talk about the fertile valleys and broad rivers of faraway California, and on the 1st of May, 1844, Marshall, with a train consisting of 100 wagons, set out for the then almost unexplored West. After a weary journey, full of adventures and vicissitudes, the party reached California in June, 1845, and camped at Cache Creek, about 40 miles from where Sacramento now stands. The adventurers parted here, journeying in several directions, Marshall and a few others going to Sutter's fort, in this county, where Marshall went to work for General Sutter.

Marshall's life at the fort was an uneventful one up to the Summer of 1846, when the Mexicans, hearing that a large body of American emigrants were crossing the plains, resolved to prevent them from entering California. At this time General Fremont was camped at Sutter Buttes, near Marysville and he, joined by Sutter, Marshall and other whites, prepared to defend their countrymen, and what was known as the Bear Flag war was inaugurated. Marshall took a prominent part in all the engagements of that short war. When at last, in March 1847, the treaty was signed by which the independence of California was secured, Marshall procured his discharge from the volunteer service and returned to Sutter's Fort.

Before the breaking out of the Bear Flag war, Marshall had purchased two leagues of land on the north side of Butte creek, in what is now known as Butte county. When he arrived here he found that the majority of his stock had strayed or been stolen. He did not waste his time in vain regrets, however, but set about to formulate a plan to retrieve his fortunes. He decided to go into the lumbering business, and fixed upon Coloma, in El Dorado county, as a good location for a sawmill. Sutter was to furnish the capital for the enterprise, and Marshall was to be the active partner. The articles of partnership were drawn up by General John Bidwell, and work was commenced on the mill about August 19, 1847.

We now approach the most important event in the life of Marshall. On the 18th of January, 1848, Marshall was superintending the building of the mill race. After shutting off the water at the head of the race, he walked down the ditch to see what sand and gravel had been removed during the previous night. He strolled to the lower end of the race and stood looking down at the mass of debris. At this juncture his eye caught the glitter of something that lay lodged in a crevice on a riffle of soft granite. He stooped and picked up the substance. It was heavy, of a peculiar color, and different from anything he had seen in the stream before. He reflected as to what kind of mineral the specimen could be, and finally concluded that it was either mica, sulphurets of copper—or gold! It was too heavy for mica, was not brittle, as are sulphurets; and, remembering that gold is malleable, he placed the nugget on a flat stone and began striking it with another. The substance did not crack or flake off, but simply flattened under the blows, and Marshall was satisfied that he had indeed made an important discovery.

In several days he collected a few ounces of the precious metal, and, as he had occasion to visit Sutter's fort in a short time, he took the specimens with him. He informed Sutter of his discovery, but the General was incredulous, and it was not until chemical experiments had settled the question beyond all doubt that he would admit that the mineral was gold. At last all doubts faded, and the excitement began to spread. The news flew over the country like wildfire, and those whites who were then in California went into the quest for gold with great ardor and energy. Additional revelations were made daily, and the news of the discoveries was spread. Then came the mad rush from the East and the Old World. It was a furious race for wealth. In 1849 every sailing vessel and steamer landing at San Francisco was crowded with adventurers. They know that gold had first been found at Coloma, and many went thither. Without inquiry or negotiation they squatted upon Marshall's land about the mill, seized his work-oxen for food, confiscated his horses, and marked the land off into town lots and distributed them among themselves.

From this time on Marshall was the victim of petty persecutions. Many believed that he knew of the whereabouts of valuable gold mines, and he was watched closely and badgered because he did not give information. Robbed of his property, he became a prospector, but never with great success. The discovery which brought fortunes to thousands, and made California a great State, proved his financial ruin,

JAMES W. MARSHALL, THE DISCOVERER OF GOLD IN CALIFORNIA.

and subjected him to endless insults and injuries. He became involved in litigation as to the title of his land purchased in 1846 or 1847, and finally lost it all. To-day he is a poor man. He resides at Coloma, near the spot where, 36 years ago, he picked the glittering nugget from the sand. He has received some assistance from the State, but never anything commensurate with his deserts.

The Young Engineers' Own Book.—A new work with this title has been issued by Stephen Roper, author of practical hand books for engineers. It is a hand book for mechanical engineers, and is bound in morocco with a flap, so as to be readily carried in the pocket. The book contains descriptions of different kinds of steam engines, together with instructions how to design, proportion, locate, repair, reverse and run all classes of engines, with table and formula for finding their power. Also, suggestions on care, selection and management of all sorts of boilers, pumps, injectors, etc. The book is intended for the use of educational institutions, where students intend to engage in mechanical pursuits, and for the private instruction of youths, who show an inclination for steam engineering. The work is plainly and clearly written, with an observable absence of abstruse technicality, which usually confuses a beginner. It appears to be exactly what it is intended—a young engineer's book, and is a very useful publication. It costs three dollars, and is for sale by Bancroft & Co., in this city.

A few days since one of Hill's Triumph Ore Mills was shipped to Beowawe, Nevada, to be placed on the Lady of the Lake silver mine, in Bullion district, 25 miles south from Beowawe. This mill was accompanied by one of Radovich's Rock Reducers.

Local Change to Standard Time.

On the 1st of November, the Central and Southern Pacific Railroad Companies will change from local time to standard meridian time, and ferries and trains will after that date be run in the latter time. It is probable that as in other places, the standard will be adopted generally instead of local time. The time is furnished to the railroads by Randolph & Co., on the corner of Sutter and Montgomery streets. The U. S. Coast and Geodetic Survey has determined the exact geographical position of Randolph's building, and it makes the time 9 minutes 36.6 seconds *faster* than the local time.

Until the standard time was adopted by the railroads in this country, the trains were run under 53 different kinds of time. Now they are run under five. The Inter-Colonial embraces Nova Scotia and New Brunswick; Eastern embraces the New England States, New York, Pennsylvania and States south of Pennsylvania; Central includes Illinois, Ohio, Indiana, Missouri and States north and south of them; Mountain comprises the roads of the Missouri river in the mountains, and Pacific, the lines on this coast.

The 90th meridian, on which Central time is based, is nine minutes slower than Chicago solar time. The 75th meridian, which gives Eastern time, is one hour faster than Central, or four minutes slower than New York solar time. Inter-Colonial time—60th meridian—is two hours faster than Central time. Mountain time, based on the 105th meridian, is one hour slower than Central. Pacific time, based on the 12th meridian, is two hours slower than Central time.

For some time back the standard time has been adopted elsewhere, but the Pacific Division has not adopted it until now. When it prevails here generally, the timepieces between this city and Ogden will keep the same time, the local time being disregarded. The difference between the *solar* and the *standard* time in some of the cities of the Pacific Division is as follows: The standard time is 12 minutes 0 seconds faster than the local time of Olympia, W. T.; 9 minuts 50 seconds faster than Portland, Oregon; 14 minutes 40 seconds slower than Boise, Idaho; 1 minute 40 seconds slower than Virginia, Nev.; 9 minutes 36.6 seconds faster than San Francisco; 55 minutes 44 seconds faster than Sacramento.

Among other California mines which are paying well, but of which little is heard, is the Plymouth Consolidated, in Amador county. It is owned by Alvinza Hayward and others of this city. It has paid dividends at the rate of $50,000 per month for seventeen consecutive months, the last one being paid on the 4th inst. The bullion product of this mine for the first nine months of the year foots up $780,506. It is needless to say the stock of this mine is not on the market.

A copper mine in Africa, operated by English capital, paid a dividend of $100,000 in London in September, and a gold mine in Venezuela, also operated by English capital, paid a dividend of $180,000 in the same month and place.

Boulder Valley, Montana.

This town is the county seat of Jefferson county, made so less than a year ago. It lies in the midst of a small valley of a similar name, and is on the old stage line from Helena to Butte City, which is equivalent to the present stage line from Jefferson City to Butte. It is about 20 miles from the former place, and 38 miles from Butte. Not being a railroad town, it has never had any boom, and is of very modest dimensions. It has, however, three or four country stores, a good hotel, kept by M. D. Cooper, wagon and blacksmith shops, etc. It stands a good chance of securing railroad advantages in the near future, as it is quite certain that the Northern Pacific Co. will extend its line through Boulder valley in making a connection between Helena and Butte. A branch from Helena already points in this direction, with Jefferson City as the place from whence the Boulder valley and Butte extension would branch off. There is a natural grade along the entire line of such a proposed route, as the stage road now follows up water courses both to and from Boulder valley. The desire of the N. P. R. R. Co. to secure a portion of the Butte business, now almost monopolized by the Utah & Northern, will, it is considered certain, secure the building of the road in question. Then Boulder valley will not be so isolated, and its natural advantages will be recognized and developed. These are not inconsiderable. It is surrounded by, or adjacent to, a fair agricultural region. It is also convenient to a heavily timbered country, from whence Butte City has derived a good portion of her supply for many years. Into the valley flows the beautiful Boulder creek, which heads well up in the mountains back from the valley. This stream will afford ample water privileges to stimulate the development of the mines which are contiguous to the town. These are many in number, and some of them seem to promise well indeed. There is little said or written about the mines in Boulder district, and there is an impression abroad that they contain ores too base for economical reduction. But while there on a visit we saw some excellent ores, and learned from reliable parties of mines with fine prospects, all within a few miles of Boulder. The ores unquestionably need concentration, and perhaps thorough treatment in reduction works; but of there being claims of value in the Boulder district, which are worth developing, we have not the slightest doubt. With the conveniences for such development when the railroad arrives, what will prevent Boulder from taking a start forward in the progress which is in store for her?

The warm sulphur springs of Boulder valley are already famous throughout Montana. The water of these springs is beneficial when used as a beverage, and for the cure of rheumatism no waters are superior as a bath. Any degree of heat, from moderately tepid to unbearably hot, can be had, as there are hot and cold springs contiguous. Comfortable buildings are already erected, and other improvements are contemplated. A large plunge or swimming bath is one of the enjoyable features of the springs. D. S. Merrill is the wide awake proprietor of the property.

Among the oldest settlers of Boulder valley, Capt. H. Cook, and Judge A. J. Elder are prominent. They set their stakes in the camp 16 years ago, and have remained steadfast at their posts since; Messrs. Thompson and Cook, Jr., the latter now postmaster, are also two stand-bys in the town. We think they will all see the day when Boulder valley will be the point for trade and the center for mining operations which their fondest hopes have pictured. We shall watch the future of this town with much interest.

Coeur D'Alene—A dispatch from Portland, Oregon says: Parties arriving from Coeur d'Alene bring better reports from the mines of that section. Good strikes have been made in the old wash gravel, 15 miles from Eagle City, out of which 10 cents a pan is being taken. This is considered one of the richest strikes made this year. On Pritchard Creek, the work is being rapidly prosecuted, with fair results. Bedrock has been reached in a number of instances. The water is more plentiful, and the miners are turning out plenty of pay dirt. Last month's production was about $300,000 in dust and nuggets.

Elevated Railway Passenger Traffic.

In 1874 a sanguine man predicted that within ten years the elevated roads in the vicinity of New York would carry 50,000,000 passengers a year. This was a bold prediction, for the elevated roads in the year then just closed had carried only 796,072 passengers. The estimate of 50,000,000 passeugers in ten years was ridiculed. But mark the result. In 1879 the passengers transported numbered 46,000,000, and in 1880, six years after the above prediction was made, the passengers carried aggregated 60,831,757. The ten years expired on the 30th of September last, and the statistics, published for the first sime yesterday, show the passengers carried to have been, not 50,000,000, hut 96,688,992. Who would have dared to predict sucb a result?

It takes comparison to bring out the meaning of tbe statement that the elevated roads carried almost 97,000,000 of people last year. Take the passengers transported by leading roads for the last reported fiscal year:

New York Central	10,746,925
New York, Lake Erie and Western	6,934,924
New York, New Haven and Hartford	7,079,168
Lake Shore	3,909,356
Burlington and Quincy	4,125,637
Milwaukee and St. Paul	4,591,231
Chicago and Rock Island	2,784,722
Chicago and Northwestern	7,968,560
Total	48,138,334

That is to say: Eight of the leading roads of the country carried less than half as many passengers in the last fiscal year, as were carried by the Manhattan Elevated road in the same uumber of months. The increase in the number of passengers in 1884 over tbe uumber carried in 1879 was 50,643,811, or about 110 per cent; this, too, without any extension of the elevated railroad lines. It was simply new business—the result of the facilities offered and of tne city's growth. Does anybody suppose that the city is going to stop growing?

The population of New York city in 1860 was 805,651; in 1870, 942,292; and in 1880, 1,206,-299. Iu 1865 the real estate valuation of the city was $427,360,884, in 1875 it was $883,643,-545, and in 1884, $1,119,761,597. The elevated roads are the very thing which will give the city the power of indefinite growtb. Travel uowadays is not a matter of distance, but of time. Harlem, with the elevated roads, is not further from the City Hall tban was Twenty-third street under the borse-car regime. The New Yorker counts on an hour from house to office. Before the city is fully built up to a point one hour by elevated road from the City Hall, New York will coutain over 2,000,000 people.

Turn now to the financial results: In 1873 the New York Elevated road earned $64,602. For the year just closed, New York Elevated and Metropolitan (now Manhattan) earned $6,724,-831. The past year has not been a brilliant period in railroad history. It has been worse than either of the years immediately preceding; yet even the last three years do not show much in the way of surface railroad growth. Following is a comparison of earnings per mile of roads representing various sections for the years named:

EARNINGS, PER MILE.

	1880.	1881.	1882.	1883.
N. Y. Central	$30,288	$29,520	$23,484	$31,861
Erie	12,224	13,530	12,770	11,918
Pennsylvania	23,201	23,579	24,398	24,375
Lake Shore	15,922	15,261	14,306	13,817
Mich. Central	11,137	9,595	8,797	9,542
Wabash	6,398	5,511	4,954	4,778
Northwest	7,829	7,311	7,809	6,950
Ill. Central	7,110	7,833	7,498	6,776

Only two roads, New York Central and Pennsylvania, earned more per mile, gross, in 1883, than they did in the years preceding. Look now at the growth of earnings on the elevated roads. We give the earnings in gross because there has been no increase in mileage:

ELEVATED RAILROAD EARNINGS.

1880	$4,612,975	Inc.	$1,086,150
1881	5,311,075	Inc.	638,100
1882	5,973,633	Inc.	662,558
1883	6,386,505	Inc.	412,872
1884	6,724,831	Inc.	338,326

Two poiuts here deserve attention: 1.—The fact that the elevated railroad earnings have had large and steady growth at a time when the earnings of the otber roads have been either at a standstill or running behind. 2.—The fact that the increase in gross earnings of $3,198,006 has been obtained without a dollar of increased cost; it has all been net profit.

Mauhattau represents a road which is never blocked up nor washed away; its crops do not fail; its local business is excellent, and its through business often fills every seat in the train before it gets out of Harlem. A public man has truly said that if the running of the elevated trains should be stopped it would cause a revolution. The elevated roads are the main arteries of the city's life. Whoever believes in the future of the city must perforce believe in the future of the elevated roads.—*N. Y. Mail and Express.*

CRYOLITE. — Cryolite, with its associated minerals, gearksutite, thomsenolite, etc., occurs sparingly in the crystal beds near Pike's Peak, in Colorado. Its occurrence elsewhere iu the West is not known. Cryolite is used for making soda, in tbe manufacture of a white porcelain-like glass, and to a very small extent in the manufacture of aluminum. The main supply comes from the cryolite bed at Evigtok (or Ivikioh), in Greenland.

How Snow Benefits Mining.

The Denver *Tribune-Republican*, says: In some of the more altitudinous camps tbe snow bas already fallen to tbe depth of nearly six inches, indicating tbat winter is close at hand and that preparations for the customary siege cannot long be delayed. The snow-bound localities receive their greatest and steadiest development in the winter months when the miner is imprisoned by the elements and tbus forced to devote his energies to the exploration of the particular mineral vein upon or in which he has his habitation. Promiscuous prospecting and the other attractions whicb consume his time and divide his labors when the ground is bare, cannot be indulged in, and hence his efforts are concentrated to one particular spot, resulting very frequently in the opening of a mine of pronounced value, which should be credited to the snow rather than to the miner. The snow, therefore is beneficial to the mining interests in more ways tban appears nntil tbe matter is closely studied. The acquirement of ground is the bane of all new districts, and snow is about the only agent or influence which can control tbe actions of the stubborn miner and force him to concentrate his labor for a particular period upon any chosen claim.

When the snow is piled around and upon bim so that it is both laborious and dangerous to leave his winter quarters, then the miner will kill time by working like a beaver on the mineral ground he has selected for hibernal operations. Mines situated in localities where snow closes egress and ingress for montbs are apt to be kept systematically opened and not gutted, as in sections where a market is ever at the dump. Three months of absolute embargo on ore shipments from all the mines of the State would be the best thing that could happen to the mining industry, as it would give a cessation from production and permit tbe mines to recuperate from the constant strain and drain now given them. If the miner, like the farmer, had certain seasons for marketing his product, mining ground would be tilled and tended with more intelligence than now. Snow is bad to look at and think about, but it has its uses and benefits, and good mineral veins will never be disdained by the prospector or capitalist because they are in a heavy snow belt.

Buying Mines.

The Nevada *Transcript*, in speaking of a gentleman who has been buying mines in that vicinity, and who was careful to keep the object of his visit a secret, says: The course he has pursued should be adopted by all would-be purchasers of claims in any district. Had he made his business known on coming here, he would have been annoyed by every croaker in the district and by men who had ground to sell, and the property he has bonded would have been denounced (no matter how much value it possessed) as the very worst kind of frauds, and he would have been warned that he was throwing his money away, etc. At least this has been the case in many instances during the past few years, although this place is no worse in that respect than almost any other mining community. Not long ago a gentleman arrived here for the purpose of buying a quartz mine if he could find one that suited him. He asked as a personal favor that this paper would not mention his name or his business, as his experience in other camps had been such that he desired to avoid a repetition of it here. The first gentleman spoken of in this article had never heen in this part of the State before, and when he went away he expressed great surprise that capitalists from everywhere did not come in here, where the most of the mines seem to warrant the largest kinds of investments. He, as well as many other intelligent and observing strangers who have been here, predicts that when our mines become properly appreciated we will have a boom that will scare all the croakers, and be a joyous surprise to even those who look forward with so much confidence in in the district. There is no use disguising the fact—we do not appreciate our surroundings. For years and years to come real estate here will not reach any lower figure than it commands to-day. We have at our very doors, almost, thousands of acres of mining ground that has never been prospected, and in course of time, when our prospectors become more numerous and capital begins to flow in, we will have many such mines as the Providence, Merrifield, Wyoming, Nevada City and Mountaineer. Tbe outlook is good, and it requires live men with capital to bring it up to the standard which it merits. If any one wants to find out what class of men are constantly giving this district a black eye, and injuring themselves, let him take the trouble to be around when this article is being read.

SOME NUGGETS.—The largest nugget of gold ever taken out in Siskiyou county as far as is known, weighed a trifle over $3,220. Two other nuggets each weighing nearly $3,000, have also been discovered. Joe Cora was the lucky finder of one of the latter, which he picked up in a claim at Hawkinsville some ten years ago. In this connection we might add that 181 ounces were taken out in ten hours at Scott Bar, in early days just back of where the hotel now stands.—*Sierra Tribune.*

Mines Near Death Valley.

A correspondent of the Calico *Print* says: The mining regions north and east of Calico are beginning, now that developments have been made, to attract some of the attention from capital which they so richly deserve. On last Sunday morning Mr. Koebig, of Milwaukee, a gentleman well versed in mining and representing a goodly amount of capital, left on a tour of inspection for the Ivanwap mountains, at the southwest end of Death valley. These mines, now owued by Bateman & Co., have been worked upon at various times, and considerable developments made, and comprise ledges carrying gold, silver, lead and copper, and would make a valuable property in the hands of practical men of capital. Recently Messrs. Frank Deming and Joe Cook struck what promises to be a very valuable gold ledge near the mouth of Cave canyon, upon whicb they have built an arastra and commenced working on ore this week. The Ibex mill and mine have not started up yet, but there is a possibility of their doing so this fall. The borax works of Wm. T. Coleman & Co. have stopped operations on the Amargosa mines and have taken their forces to Furniss creek, in Death valley, where they are putting in works to crystallize a mucb larger quantity of refined borax than formerly.

Mr. Wm. M. Stockton reports favorably of the mines on the headwaters of the Amargosa, in Bromide district, and the indications are tbat some rich mines will be developed within the coming season. Everything in that section is exceedingly promising. There is one thing, however, that miners and prospectors cannot be too guarded agaiust, and that is the numerous miuing sharks and grasshopper experts, who, since the downfall of Virginia City, infest new districts, and by their insinuating ways and clap-trap promises, seek with the cbeek of a cast iron mule, and by depreciating good property thereby to gain credit with a few unprincipled capitalists of San Francisco to swindle them out of their hard-earned property. Hardly a week passes by but one of these sostyled experts are to be seen in our midst seeking like wolves whom tbey may devour, and are ever ready to take a look at your mines, and unless you put a goodly amount of lubricating oil on tbeir palms will give an adverse opinion and report unfavorably on your property, no matter how good it may be.

A SMALL CRUSHING OUTFIT.—In the following from the Nevada City *Transcript* is a hint that might be acted upon to advantage by some of the small miners all over the coast: J. J. Ott has erected in the rear portion of his assaying establishment on Main street, a 2-stamp quartz mill with which to crush sample lots of ore for himself and others. The stamps weigh about 80 pounds apiece, and are run by a Pelton water-wheel about 30 iuches in diameter, which was made and presented to Mr. Ott by his son-in law, John Blausoff. The water that makes the wheel turn comes from a common hydrant and passes through a rubber garden hose and a nozzle, tbe latter throwing a stream not much greater in circumference than the stem of a clay pipe. Yet so well is the machinery arranged that the mill crushes with that small amount of water from 400 to 500 pounds of quartz in ten hours. Mr. Ott is going to rig up an amalgamator in conuection with the battery, and will soon have the miniature mill so that it will save every particle of gold coming from the quartz he works.

OZOCERITE.—A deposit of native paraffiue or mineral wax (ozocerite) was discovered in Southern Utah during the summer of 1877. This find was considered so valuable that a company, having headquarters in Boston, was formed the next year for working the deposit, which has since heen mined quite extensively and with some profit. The crude material is said to be of good quality, samples sent to England to be tested having been pronounced equal to the best Turkish. Other samples analyzed in San Francisco were found to contain a large percentage of white wax, of the kind used in making paraffine candles. It is said that this substance can be mined and delivered in Boston at a cost of 4 cents per pound. Ozocerite occurs in beds of coal, or associated bituminous substances. It is found at Slanik, Moldavia, and at the foot of the Carpathians, but is not common. It is like wax or spermaceti in appearauce and consistency, ranging in color from an impure white to black; frequently brown or green.

CLAYTON AIR COMPRESSORS.—The Clayton Air Compressor Works, located near the Brooklyn bridge, Brooklyn, N. Y., have lately shipped several car loads of mining and tunneling machinery to the West, comprising the Clayton Improved Duplex air compressors, rock drills, Duplex water pumps (for mining drainage), steam boilers, pipe, steel, etc. Among the mines which have recently added the Clayton air compressor to their plants, are the Big Bend Tunnel and Mining Co., and the Fresno Enterprise Co. of California. The Copper Queen Mining Co., and the Tombstone Mill and Mining Co. of Arizona. A number of orders for large air compressors are booked, and business prospects for the fall, are reported as excellent.

Notices of Recent Patents.

Among tbe patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

TWO-WHEELED VEHICLE.—Frank A. Knox, Woodland, Yolo county. No. 303,738. Dated August 19, 1884. This invention relates to that class of two-wheeled vehicles commonly known as carts, and particularly to the shafts or thills thereof and their conuection with tbe body of the vehicle. It consists in severed shafts, the adjoining ends of which are connected by a peculiar spring-hinge. The rear portions of the shafts form a support or frame for the body. The object is to relieve the jogging motion.

PEN-BRUSH.—George Madeira, Santa Cruz. Assignor of one-half to F. G. Gilmore, S. F. No. 305,612. Dated Sept. 23, 1884. The invention relates to a device to be used by painters and draftsmen, wbich is termed a "pen-brush," which consists of a combination of devices. There is a striping brush, and a color-fountain with adjusting strap to regulate the width of the brusb.

MINER'S PICK.—Dock E. W. Taylor, S. F., No. 304,373. Dated Sept. 2, 1884. This improvement in picks consists in the construction of a head with sockets formed on opposite sides to receive arms or points, and a means for receiving them at will; also, a socket for the handle, with wedges at the inner end or base, by which to fix the handle in place, and a wedge-shaped concave section upon each side, which will serve to split roots, etc.

LUBRICATOR.—August Lotz, San Jose, No. 305,608. Dated Sept. 23, 1884. This lubricator is of that class in which the flow of feed of the lubricating material is governed by the movement of the machinery it effects. The invention consists in a plug or cylinder adapted to be rotated by tbe power shaft, and having a receptacle or chamber in its surface, by which the rotation of the plug is brought into relation with the discharge of the oil cup to receive its oil, which is thence carried down and discbarged into a suitable passage or opening upon the part to be lubricated.

TRACE BUCKLE.—Wm. J. Butler, Salinas, No. 304,499. Dated Sept. 2, 1884. This buckle is of that class in which a bail or loop in the end of the hame-tug is employed to secure the buckle devices engaging with the trace, and the inventiou consists in the two independent plates, one of which is provided with two tongues adapted to engage with the swinging bail attached to the hame-tug in a peculiar manner. The object is to construct a simple and strong buckle, which will permit the ready adjustment of the trace, and relieve the strain on the tongues and the holes in the trace, holding said traces straigbt to prevent kinking, and in which auy thickness of trace may be used.

ENGINE GOVERNOR.—John L. Heald, Crockett, Contra Costa Co. No. 305,816. Dated Sept. 30, 1884. This invention relates to certain improvements in governors which act by centrifugal force; and it consists in a pair of weighted arms crossing each other diagonally to a central vertical line, and having their lower ends hinged to a horizontally rotating disk or table. To the sides of this table springs are secured behind each arm, so as to curve above them, the upper euds of the springs being counected by links with the upper weighted ends of the arms, so that their tendency is to counteract the centrifugal action of the arms when in motion. The arms act upon a vertical adjustable central stem, which connects with a double balanced valve.

DYE VAT.—Carl A. Hoffman, S. F. No. 305,818. Dated Sept. 30, 1884. This is an improvement in and process for dycing and drying wool, cotton, slubbiug, and other loose-fiber material, and it consists in confining and packing the material within a vessel, and forcing the dye-stuff through the mass, and subsequently drying it while still confined. The apparatus consists of an exterior vat or tank for containing the dye-stuff, an interior vessel having a lower and upper foraminous diaphragm, between which the material to be dyed and dried is confined; in a means for pressing the material in the vessel; in a pipe and force-pump for pumping the dye-stuff in the vat up through the foraminous diaphragms and intervening material, and in a hot-air pipe for dryiug the material.

APPARATUS FOR WORKING DERRICK-FORKS.—Cassius Stone, Walnut Creek, Contra Costa Co., Cal. No. 304,968. Dated Sept. 9, 1884. The apparatus is for working derrick-forks and carrying unthrashed straw from the stack to the feed-stall of a thrashing machine. It consists of two forks with ropes attached to them to draw up the loaded fork, and at the same time return the empty one for another load, an arraugement of pulleys over which these ropes pass, and carts to the axle of each of which the rope for hauling up one fork is attached, while tbe ropc for hauling down the other fork is connected with a drum upon the cart, this drum being revolved by gearing so as to take up auy slack in the ropc; or it may be allowed to rotate freely. The carts are hauled away and backed up to the derrick alternately so tbat the forks are worked alternately.

OUR FOREIGN TRADE.—Mr. Albert Shaw, in his late official report as United States Consul in Manchester, exhorts his countrymen in earnest fashion to renewed efforts to rival English manufacturers in the markets of the East. Nothing, Mr. Shaw thinks, is more easy, not excepting from his view even the great English staples, cotton and hardware. All that they have to do is "to adopt the proved English methods," under which British trade has "grown by slow degrees into an almost faultless monopoly. There are (he adds) no mysteries about the processes by which English supremacy has been obtained. The course they adopted is open to us, and the results they have achieved we can expect to realize, in part, at least, when we are as wise, as courageous, and as enterprising as English statesmen and merchants have been, in extending their trade among the distant nations of the earth." He adds, whatever it may mean, that "the concentrated pressure of foreign competition and constantly diminishing profits combine to gradually create a feeling of unrest, that must sooner or later find expression in a demand for a 'change' in the commercial policy of the country. Of this I have no doubt."

THE DEEP WINZE ON THE COMSTOCK.—There are very few persons, besides the miners employed, who have even a vague idea of the gloomy depth of the deep winze now being sunk by the Ophir, Mexican and Union Con. jointly. The deepest gold mine in the world is the Eureka (Hayward's), in Nevada county, Cal., which is down 2,200 feet about 500 feet below the level of the sea; but the grnesome blackness of the Mexican winze is beyond reach of a man's mind. It is about 3,000 feet from McClurg's store on South C street to the First Ward schoolhouse. If this portion of C street could be stood "end up," it would not reach the bottom of the sump by 300 feet. It seems hardly possible, but such is the case. Captain James Townsend, an eminent navigator now residing in this city, says that if the winze were continued clear through the earth it would hit Cape Albany, the southeasterly point of Australia. There is no telling how much deeper explorations will be made on the Comstock, but pretty soon some one will have to scratch his head to get up a steel wire strong enough to hold its own weight.

NEW GOLD MINES.—A dispatch from Victoria, B. C., October 15th, says: The steamer Boscowitz arrived from the north last evening, bringing encouraging news from the Lorne creek mines. B. W. Washburn and a party of four, took from their claim $3,000 in gold in one month. Other claims are doing equally as well, from $3,000 to $7,000 being taken out of each claim during the past month. A big rush to the mines is expected in the spring. Miners are taking $8 to $10 per day. The diggings are easy of access by canoe, 80 miles from the mouth of the Skeena river. Provisions are plenty. The Northern Indians are still troublesome, and the miners fear an outbreak. At Metlakathla the Indians nailed up the door of Bishop Ridley's mission house, and otherwise made themselves obnoxious. Settlers say the Indians will have to be taught a severe lesson.

GERMAN TECHNICAL SCHOOLS.—Germany is paying increased attention of late to her technical schools. She has established schools devoted to specialties in almost every possible branch of industry. A tailor's "academy" has recently been established in the city of Dresden which last year numbered 355 pupils of both sexes. Of these the majority were men who devoted themselves to learning how to cut men's clothing; 239 took this course. Ninety-two pupils of both sexes received instruction in cutting ladies' and children's dresses, and 24 in cutting underclothing. The academy also offered instruction in commercial arithmetic and book-keeping, and 98 pupils embraced the opportunity of learning these branches.

A FURNACE FOR SPRUCEMONT.—Willis G. Dodd, mechanical engineer for the Pacific Iron Works of San Francisco, who came down from Sprucemont yesterday, says the Elko *Independent*, states that arrangements for the erection of a smelting furnace on the eastern side of the mountain, for Harrell, Scherff & Co., for the reduction of ore from their mines, have been made. Mr. Dodd was on his way to the Bay, and at Truckee will order the shipment of lumber necessary for the construction of a building to inclose the furnace. Water for supplying the furnace will be brought in pipes a distance of four miles. The mines are reported as being immense; amply justifying the heavy outlay contracted by the company.

ANOTHER NEW PROCESS.—Wm. McGeorge and John W. Dixon, of Philadelphia, accompanied by John F. Carter, of San Francisco, were in town yesterday. The first two gentlemen are interested in a newly discovered method of working refractory ores, by which they hope to successfully work the rebellious ore obtained in the Meadow Lake district.—*Nevada Herald.*

IN the Pullman Car Works recently, 100 cars were constructed, painted and furnished during the regular working hours of one day.

USEFUL INFORMATION.

Lime Water.

The housekeeper should never be without a bottle of lime water. To have it always ready and in good order, with little expense, place in a tall quart bottle of any kind a gill or so of good lime just slaked with water. Then fill the bottle with rain or other pure water, and allow it to stand quietly, well corked. The lime will settle, leaving clear lime water at the top. Pour this off gently as wanted, adding more water as needed. Lime water, even when closely corked, often deteriorates. The carbonic acid in the air unites with the lime, and settles as an insoluble carbonate on the sides of the bottle, which is nearly impossible to remove. This will spoil the bottle for any other use. Therefore select one from the storeroom which is not valued, but which has a good, tight cover. A wide-mouthed bottle is preferable. The lime should be removed and fresh put in once a year or so, unless kept very tightly corked. A pint of cold water dissolves less than ten grains of lime, and warm water still less. The uses lime water may be put to are innumerable. If good milk disagrees with a child or grown person, three or four tablespoonfuls of lime water added to a pint of it will usually help digestion and prevent flatulence; it also counteracts pain from wind in the stomach caused by eating acid fruits. Overeating of candies and other sweets will sometimes cause acidity, for which this is a sovereign remedy. A tablespoonful for a child of two years old to a gill or more for an adult is an ordinary dose, while considerable will have no bad results. In fact, it is a simple anti-acid and slightly tonic. A small quantity put into the tooth-mug with the water for cleaning the teeth will harden the gums and prevent soft decay, which is a serious evil which many desire to avert. For burns and scalds, to two parts of linseed oil add one part of lime water, and apply with soft linen.

A NEW FIRE-PROOF DOOR AND WINDOW SHUTTER.—There is nothing yet invented that can be said to be absolutely fire-proof which affords protection to window spaces or doorways, but the heavy wooden door shutter encased in tin has undoubted advantages. If two thicknesses of inch board—pine being preferable, because it does not warp—are nailed crosswise and fully encased in tin, locked and soldered, and thoroughly nailed under the locking, the outer surface of the wood under the tin will be speedily reduced to charcoal by the action of the heat, through the combustion of the small amount of oxygen under the tin. The charcoal itself then becomes a very effective non-conductor of heat, and, if the tin is tight so that no further supply of oxygen reaches the unburnt wood beneath the charcoal, it will remain cool and strong for some hours, thus giving time to control the fire where it starts. Iron doors and shutters, on the contrary, when exposed to severe heat, become so quickly warped and twisted as to be practically useless as safeguards.

POROSITY OF WOOD.—An unpainted wooden pail showed some of its staves saturated and others nearly dry. Experiments with wood of the same character—the cucumber wood—showed that pieces sawed from the same board differed in their absorptive qualities as one end or the other was set in water, the trials appearing to suggest that when the wood was placed in water as it grew, butt downward, the water was absorbed more rapidly than when the position was reversed. As a further test two pieces were taken from the same board, and both painted on the outside—both faces—but one had the top end also painted, and the other the bottom, or butt end, painted. The one with the unpainted butt filled and sank, while the other floated. Perhaps differing results would have been obtained with differing woods. The fact of position affecting saturation seems to be recognized in the frequent custom of reversing fence posts from their natural position and in the driving of piles.

A HOUSE IN ANCIENT POMPEII.—The wonderful developments in regard to the mode of living of the early Romans are forcibly illustrated by the following recent discovery by the excavations in Pompeii: One house in Pompeii had evidently been in a state of repair when the volcano storm buried it. Painters' pots and brushes and workmen's tools were scattered about. Spots of whitewash starred wall and floor. Pots and kettles had been bundled up in a corner all by themselves. Dinner, however, had not been forgotten. A solitary pot stood on the stove. And there was a brown dish in waiting before the oven, and on the dish a sucking pig, all ready to be baked. But the oven was already engaged with its full complement of bread, so the sucking pig had to wait. And it never entered the oven, and the loaves were never taken out until after a sojourn of 1,700 years. The pig and the bread had been there since November 23d, A. D. 79. M. Florelli added the loaves to his museum at Pompeii—21 of them, rather hard, of course, and black, but perfectly preserved.

A NEW ENAMELING PROCESS.—A patent has been recently taken out in Germany for enameling ceramic articles by a new process. The glass, terra-cotta, stoneware, porcelain, or similar articles is covered with a film capable of conducting electricity, by painting the articles with a solution of chloride of platinum or nitrate of silver and burning this in, and then decorating, as desired, with enamel. The galvanic coating does not adhere to the enamel, and very varied effects can be produced by gilding, silvering, coloring, polishing, platinizing, etc., the metallic surfaces of the article.

LUBRICATING OIL.—Complaints of poor lubricating oil are common; quite as common as poor oil. A correspondent of the *American Machinist* tells the following: "In talking, a few days ago, with one of those oil men, I put a drop or two of good lard oil on the bench alongside the same amount of his oil, and, while we were discussing the merits of the oils, I happened to look at the oils on the bench. 'Now,' said I, 'where is your oil?' It was gone—all evaporated and there was nothing left, not even a grease spot; while the good oil had not changed its appearance."

A NOVEL DINING-ROOM.—The most elevated dining-room in New York is on the roof of the Washington Building, opposite the Battery. It overlooks the harbor and all its life and traffic, and is decorated with green plants and flowers in profusion. Several hundred persons can be fed there and enjoy a rare sight at the same time. The building is 10 stories high, and is devoted entirely to offices.

COLORING MEERSCHAUM.—A contributor to a London scientific paper says that a very simple and effective way of coloring a meerschaum bowl, is by painting it while you are smoking, and after it becomes warm, with the creamy surface of good milk (or with cream) by means of a common hair pencil, which brings out the brown and yellow colors beautifully, and as if by magic.

PAPER PULP FOR BOILER LAGGING.—Layers of paper or paper pulp, formed into a corrugated sheet, with a lining of asbestos to bear on the hot surface, is a new form of boiler lagging, and is well spoken of. The intention is to make air spaces between the boiler and the lagging, and yet have a strong covering which will prevent the radiation of heat.

HIGH STRUCTURES.—The stone tower of the Philadelphia city hall, now in course of erection, will be, after the Washington monument, the highest structure in America. It is to be surmounted by a statue of William Penn, the crown of the hat being 535 feet from the ground. It is expected that the tower will be finished by the end of 1886.

DRESSING FOR LEATHER.—Some one says a good dressing for leather is made of one quart of vinegar, two ounces of spermaceti oil and six ounces each of molasses and ivory black.

GOOD HEALTH.

Mortality Among Miners.

M. Simonin has contributed to the Paris Societe de Statistique, a paper showing the comparative deaths arising from accidents in mines in some of the countries of Europe. The subjoined table deals with metalliferous and coal mines, whereas in the other tables given by the author coal only is referred to. The author also found it impossible to obtain uniform statistics, as far as the period of time was concerned, that of France, England, Belgium and Prussia extending over on average of ten years, while for Austria it is only six. France appears to be the best protected country in the respect of safety, and Saxony the worst.

Country.	Number of Miners.	No. killed per 1,000.
Saxony	15,673	3.39
Prussia	.....	2.89
Belgium	76,607	2.38
Great Britain	558,817	2.18
Austria	41,133	2.16
France	105,742	2.09

TO REMOVE PIMPLES.—An Oakland correspondent writes as follows: "I am in the habit of reading your paper, and have especially noticed your receipts for sickness. I have tried everything I could hear of in medicine for the removal of pimples, but thus far without success. Will you please give a recipe in your "Health Column" and oblige many besides, Yours truly, JOSEPH SARF." Get fifty cents worth of salicylate of soda; dissolve a small teaspoonful of the powder in an ounce vial of water and apply the liquid as a lotion. Wash the parts affected thoroughly four times a day, and especially immediately after washing, and just before retiring for the night. Should be pleased to hear the result of its application after three or four weeks trial.

A NEW ELECTRO-MEDICAL APPARATUS.—Dr. James B. Williams of this city has recently completed a new and improved electro-medical apparatus for removing cancers, tumors, fistulæ, etc., by the aid of electricity, without the use of knives, scissors or needles. It consists of three separate generators, all contained in the same case, which may be used either singly or in combination, depending upon the quantity or tension of current required to effect the removal of different sized growths. It also embraces several improvements not hitherto used in any similar apparatus, the most important being the "switch system" for regulating and controlling the currents, and the exciting fluid for the generators or piles. The switch system is very perfect in its action, enabling the operator to have *instantaneous* control over the current, and also permitting the "resting" or "alternating" of the plates, which, together with the peculiar properties of the exciting solution used, does away with the disagreeable effects of polarization, without the use of "agitators" or "air-tubes." The apparatus is supplied with electrodes of an entirely new pattern, for applying the current to external growths, as well as to growths situated in portions of the body where the use of the knife would be attended with danger.

BLACK CLOTHING.—The following practical experience of a well-known writer gives some new ideas in regard to the use of dark-colored clothing: While campaigning in a tropical country, under the hottest of suns, I became aware that a black coat was cooler than a white one, both being of the same weight, texture and thickness. The fact led me to reflection, to correlation of other facts and circumstances observed at the same time, as on other occasions. For one, I could see that my negro servant alongside me, enveloped in a coal-black skin, did not suffer from the fervid rays of the sun half so much as I under my tripe colored epidermis. What could this be but a provision of nature, merciful nature, made for him whose home was to be in the torrid zone? And the longer I remained within its limits the more could I acknowledge her kindness in tanning my cheeks, and so make them less sensitive to the scorching of the sun. From the coat upon my back and the color of my skin, thought wandered from the black bears of tropical countries, always coal-black, to the brown species of temperate climes, and on to the Arctic ice, where Ursa is robed in white. Then there is night and day, shadow and sunlight, the dark, naked ground, and the same covered with snow all, in their opposed temperatures in conformity with my belief.—*Mayne Reid.*

WAKEFULNESS.—The first effect of an excessive use of the brain is generally wakefulness. It is easy to understand why this should be the case when we bear in mind that exact observations have shown that sleep is caused by the blood in a measure flowing out of the vessels of the brain into those of other parts of the body. Of course anything that prevents the diminution of the quantity of blood in the brain, prevents sleep. Every time an individual thinks, if it be only for the hundredth part of a second, every time his emotions are excited, the vessels of the brain enlarge, and the quantity of blood they contain is increased. Normally, as soon as the thought has passed, and the emotion has faded away, the vessels contract, and when sleep is coming on, they diminish still more in calibre. But if a person thinks too much, and especially if he is anxious about some important matter, there is no opportunity for the vessels to become reduced in size. They must remain full of blood in order that the brain may do the work required. The tension is thus kept up too long, and eventually, like all over-distended bodies, they lose their elasticity, and then comes excessive wakefulness and all the evils which usually follow an over-taxed train.

GROWTH OF THE HAIR AND NAILS.—It has long been known that the hair and nails grow faster in warm weather than in cold. The *Popular Science Monthly* cites a remarkable instance of rapid growth from the statement of Col. Prjevalsky, a Russian traveler in Central Asia. In June the ground and the air became so hot that travel was impossible during the day, and the hair and beards of the party grew with astonishing rapidity. But what was strangest of all, some young Cossacks, whose faces had been entirely smooth, developed quite respectable beards in the course of a few days.

MEMBRANE OF EGG FOR SKIN GRAFTING.—In a case of extensive burn, unhealed after six years, Dr. Frank C. Wilson, of Louisville, Ky., in *Med. News*, says. "I made use of three different kinds of skin grafts, namely, from the skin of a young rabbit, from the human skin, and from the inner membrane of a perfectly fresh hen's egg." Of the three he much preferred the egg membrane as being much more readily obtained, and one egg will supply any number of grafts needed.

COUGH MEDICINE.—A cough medicine which will do no harm, even if no good comes of it, may be compounded at a trifling expense as follows: Boil two ounces of flaxseed in a quart of water and sweeten it to your taste with rock candy. Add the juice of three or four lemons, with the seeds strained out. Drink as much as is agreeable, hot, before retiring.

TOBACCO IN GERMANY.—A strong opposition is growing up in Germany against the use of tobacco. The police in the large cities have instructions to stop boys smoking, under 16 years of age. The medical faculty have found that smoking unfits German youths from developing fit for the army, in which they must all bear a part.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

TURNTABLE.—Amador *Ledger*, Oct. 18: This quartz claim is located in Pioneer district and is owned by F. Mace. It is being worked on a limited scale. A tunnel has been run into the hill, tapping the ledge at a distance of over 50 ft beneath the shaft. About 30 tons of ore have been taken out, which it is believed will pay fairly. A crushing will be made soon. If it pays $5 per ton, it can be worked profitably. The ledge varies from one to four ft in thickness, and the rock is of a ribbon character.

Fresno.

FINE GOLD GULCH.—Fresno *Republican*, Oct. 10: Col. W. R. De Frers, a pioneer prospector and mill builder of this State, has just returned from the East and will immediately commence operations on his mining properties at Fine Gold Gulch in this county. He is bringing in a large ditch for the purpose of furnishing power to run his mill and also for the purpose of ground sluicing. He has about 100 acres of ground that will pay well to sluice, and in washing this off there is a strong probability that many valuable quartz ledges will be discovered. He is possessed of abundant means, is full of pluck and energy, has had great experience in mining, and is just the man to develop the mining resources of his section.

Mono.

GREAT SIERRA CON.—Bodie *Free Press*, Oct. 4: The Great Sierra Con. Silver Company, located at Tioga Mining District, have abandoned their work for the winter. But it is the purpose, so the manager states, to start in as early as practicable in the spring and resume operations in the tunnel, also at Mount Gibbs, where they claim to have discovered free milling ore. In the face of the tunnel it is claimed they have a fair showing of ore, at least enough to satisfy the owners that the ledges do not dip further to the opposite direction from the tunnel site than a matter of 2000 ft. The temporary suspension of work was caused on account of Messrs. Swift & Aiken, who had furnished all the current funds of late, and who are endeavoring to make the rest of the stockholders come to time. Priest, the Superintendent, retires to his home on the Big Oak Flat road and Billy Onkst the foreman, heeled with a $1000 check, goes to his old Kentucky home, parched corn and roast possum for the winter.

NEW STANDARD PAY DAY.—A new feature in Bodie pay days is the New Standard. Louis Lewis, one of the owners of this private syndicate of muscle and enterprise, paid out over $6,000 the other day, and the chances are favorable that the boys will contribute from the little Miners' mill a monthly account that will astonish some of our more aristocratic companies.

BODIE CON.—Bodie *Free Press*, Oct. 20: At the mill 190 tons of tailings were worked. The average assay value is $6 per ton. At the mine the south drift, 400 level, is in 40 feet. The east cross-cut, 300 level, is in 76 feet. The mine has improved some during the week. They are getting some rich ore 50 feet below the 300 level, about 120 feet from the Standard line. They are getting fair ore in a south drift, second incline level, about the middle of the mine. They are getting very rich bunches of ore in a south drift 20 feet above the 550 (Lent shaft) level, about 60 feet from the Mono north line. No change to note in any other part of the mine. This week they will commence to ship ore to the company's mill. Number of men employed, 32.

STANDARD CON.—They extracted and shipped to the mill 516 tons of ore and 750 tons of tailings. Received from the ore 486 ounces of crude bullion, and from the tailings 204 ounces, which will be melted and shipped to the company with the result of the week's run. The stope from upraise No. 1, south drift, 500 level, is yielding some fair ore.

MONO.—The Mono winze is down 32 feet below the 600 level. The quality of the ore has improved. The walls are regular. Eight men employed.

BULWER CON.—Upraise from south drift No. 3, 385 level, is up 109 feet. The vein is about 20 inches wide.

Nevada.

MINING AT GRANITEVILLE.—Nevada *Transcript*, Oct. 18: A correspondent writing us from Graniteville says: Although mining here at present is at a standstill, there is encouraging prospects for the future. At South Fork, Maybanks and Parsons are preparing for another crushing, having run through 250 tons of rock which proved to be good ore. The old Birchville Company's mine is looked upon as a good piece of property. They have hoisting works and pumping gear that would require but very little expense to put them in running order. Also a three-compartment shaft well timbered, down 300 ft, with a four-ft ledge in the bottom, and a 5-stamp mill, with a capacity of ten, are situated near the works with a drain tunnel tapping the shaft 200 ft deep. No better property is open for capital, and parties from Grass Valley are negotiating for the same. The North Extension is the old Sweet mine, which proved to be vastly rich in early days. The South Extension was opened by Valentine, of San Francisco, many years ago. A 10-stamp mill and hoisting works were erected, and after one month's run the original owners and the company became involved in a lawsuit, and not long after the mill and hoisting works were burned to the ground. Nothing has been done to the mine since, except assessment work by the parties who now hold it. Smith and Pendleton have recently bonded their mine called the Pendleton, just below the old Erie, to the Eagle Bird Company, who are prospecting the same. It is stated by good authority that they will complete the sale at the expiration of the bond. Hippert and son are hauling 150 tons of rock from the Maggie to the Rocky Glenn mill, where from all former crushings they obtained many favorable results.

WASHINGTON ITEMS.—*Transcript*, Oct. 22: Mrs. Robinson of the Central House is reported to have bonded her Fillibuster drift gravel mine to an English Co., for $5,000, and the final transfer, if it takes place at all, is not to be till after gravel is struck. Everybody around Washington is busy. As one of the residents there expressed it, "The man who is not looking for a quartz ledge or a bee tree is scarce in these parts. We could find no use for him if he were here." A mill is about to be erected at the Lindsay mine. The Eagle Bird mine grows better and better. Work on it was started about a year ago. Out of the proceeds the mine and machinery have been paid and one dividend disbursed. The new 20-stamp mill from the foundry of G. G. Allan at this city and being erected by J. R. Collins will be pounding quart the latter part of November if the weather continues good. Several mining men from below are looking at the country, some of them for the first time. All agree that it is looming up as one of the best fields for gold quartz mining on this coast.

STRIKE IN THE BOWMAN.—Eureka *Sentinel*, Oct. 18: We are informed by I. C. C. Whitmore that last Sunday a fine body of ore was struck on the 200 level of the Bowman mine. Samples taken out then assayed $211 to the ton, and assays made yesterday show substantially the same result. Mr. Whitmore tells us that the deposit, as far as developed, shows a body of ore six ft in length and two ft wide. Should it turn out as hoped and anticipated it will prove very valuable. The Bowman is a good mine, and stands well generally in the opinion of the miners of the district. In a week or so we shall know what there is in the new strike.

San Bernardino.

CALICO NOTES.—*Print*, Oct. 18: On last Tuesday we were favored with a call from Mr. J. B. Cook, of the Providence mining district, who presented us with a number of fine specimens from the leading mines of that locality. From him we gleaned the following items of interest: The Bonanza King Mining Co. have commenced sinking from the 70th to the 80th level in the main shaft. They have lately struck large bodies of rich ore and the prospects of their mines are brighter than at any time since their opening. They have from 80 to 100 miners constantly employed and are working up about 24 tons of ore in their mill daily. Their bullion shipments will compare favorably with those of other bonanza mines. The Perseverance mine, owned by R. P. Kerr is working four men and has arrived at a depth of about 80 ft. Good ore is being taken out which is being shipped to the Kingman Sampling Works. The owners of the Belle McGilroy mines. Messrs. Dwyre & Gorman, are working several men and within the past week have struck a large body of high grade ore, showing a vein of four ft in width. The ore assays up in the hundreds. Messrs. Barrett, Cook & Co., are working a few men on the Mozart group of mines. They are opening up a very rich body of ore the indications of which are decidedly promising, and have now on the dumps several tons of rich rock. The mines generally, throughout the camp never looked better than at the present time, and that the future has millions in store for the mining men of Providence is not doubted.

San Diego.

MESA GRANDE.—Cor. San DIEGO *Sun*, Oct. 18: "Our mining interests loom right up. The Shenandoah is in good ore, and the mill is running night and day. Sinking from the 170 ft level had to be stopped until tanks can be put in the walls as the water is quite bad; but under Cox' able management things run smoothly. In looking over the records the other day, I found several new locations, among them the Sibyl, an east extension of the Shenandoah. Some very rich float has been found between the Red Hill and the river, and some little prospecting is being done. A miner's meeting is called for October 25th, to amend the by-laws and elect a recorder.

Sierra.

A MINING ENTERPRISE.—Sierra *Tribune*, Oct. 18: S. D. and Harvey Hill have made arrangements for working the Oro quartz ledge, which is located on the side of the mountain south of the Court House, and are now erecting an arastra 900 ft below the lower tunnel. The ore will be conveyed from the tunnel to the arastra by means of a chute, which is also well under way. The chute is 14x15 inches in the clear and will be paved with blocks. At the lower end of the chute an ore bin is about completed that will hold 114 tons of ore. The arastra will run by water power and is expected to crush from 6 to 7 tons in 24 hours. The work is being pushed along rapidly, and with favorable weather the arastra will be ready for operation by the 1st instant. The Oro is an old mine, 3 tunnels having been run on the vein in former years. In the lower tunnel, through which the Messrs. Hill propose working, a strong ledge is uncovered. The ore is low grade, averaging about $6 per ton. It has been milled formerly. If the results with an arastra prove satisfactory, an 8-stamp mill will take the place of it in the near future.

A PAYING QUARTZ MINE.—The Honey Comb mine, near Camptonville, is at last proving a success. It is an old mine, but for some reason has not heretofore proved a success. Lately, however, Mr. Russell, of Camptonville, and C. W. Cross, of Nevada City, came into possession of it. A 5-stamp mill was put up, with the best of results. The ore contains on an average $18.50 to the ton. The mill crushes ten tons per day. The mine contains a large body of ore as rich as that being worked. There is no doubt that the mountains contain a great number of lodes, which, if properly worked, would pay handsomely.

ALASKA.—*Mountain Messenger*, Oct. 18: There is a large amount of work being done just now at the Alaska mine, Pike City. Directly and indirectly about 150 men are employed around the works, and in getting timbers and wood. The company is burning nearly 20 cords of wood per day, the cost of which in itself is no small item. The mill is running, and rock crushed pays exceedingly well. Mr. Bates, the new superintendent, seems to be the right man in the right place. There is no doubt but that the mine will prove to be an immensely remunerative property.

PROSPECTS FAVORABLE.—This season the yield of most of the mines in Northern Sierra has been much better than for many years past. The Port Wine Ridge, from where the Union Co. ceased work on account of lack of drainage, for two miles northeast is known to contain virgin ground—extension of the rich Port Wine channel, worked by the Liberty, Cassidy, Sailer, Erie, Eagle, Queen, Golden Gate, Monte Cristo and Union Companies. The Marguerite ground has never been developed, and adjoins the Pioneer on the southwest. At Mt. Pleasant Ranch the prospecting done in the Iowa shaft proved conclusively there is a deep, wide and extensive gold lead all the way from there to Poverty Hill and Scales. The ridge between La Porte and Gibsonville has been prospected in many places with boring machines by J. H. Thomas, representing European and American capitalists. He has found gravel at depths ranging from 60 to 120 ft that prospects well enough to indicate the existence of a large main channel through that country, though on the surface there is not a quartz boulder in sight for miles. Most of the business men and many others over north own parts of this ridge, and are patiently waiting a favorable opportunity to sell to these foreign capitalists whom it is shrewdly suspicioned are endeavoring to secure as large a tract of mining ground as possible before running their main tunnels, two, three and four thousand ft to most advantageously develop the whole ridge. Unlimited capital backs this gigantic mining scheme, believed to embrace most of the territory undeveloped in this part of Plumas and Sierra counties. Next year will probably reveal more about the plans of this monied syndicate, whose success means a new lease of life and prosperity for the mining interests of Southern Plumas and Northern Sierra. The Rainbow Co. have tapped the ledge for which they were looking, with their lower tunnel. There is no doubt about its being the same ledge that was so rich above, although they are not yet under the pay chimney.

HOMER.—*Mining Index*, Oct. 18: Nothing further has been heard of the sale of the May Lundy mine for the past two or three weeks, nor of or from the new company, and not a word about "starting up." It is now the general impression here that no sale has been made, and that the sale "racket" was played upon the creditors in order to get a settlement at seventy cents on the dollar. The ore of the large blind ledge recently struck between the Ella Bloss and Golden Crown (Mount Gibbs group) at the head of Bloody canyon, south end of Tioga district, averages over $400 in silver to the ton, and is apparently as free from base metals as Comstock ores. The Virginia Creek Hydraulic Mining Company has not yet been seriously discommoded by the storms, but still has an abundance of water and is washing out large quantities of gold. Charles F. Hector and S. P. Hicks have taken several tons of high-grade ore from the Josie Green mine, and will work the same in the Esh arastra. Quite a number of men are still engaged in summit mining, both in Tioga and Prescott districts, notwithstanding the recent snow squalls. Some very rich ore is being taken out of the Golden Prince mine on Mount Haverly, owned by the Condon brothers. The Gorilla mine and reduction works are still being run full handed, and are turning out a large quantity of bullion. George W. Esh is meeting with some very fine ore in his Cora mine, in front or east of the May Lundy. Work is progressing on the Lucky Homer mine, for which the 2-stamp mill in Lake canyon was built.

Siskiyou.

THE KLAMATH QUARTZ MINE.—Yreka *Journal*, Oct. 18: The people in general will be glad to learn that this well-known mine is now paying large dividends to the shareholders, and the outlook is daily growing brighter. The mill is running by steam power, with upwards of 200 tons of good rock on the dump. A run of 29 days, just closed, under the management of Mr. J. B. Tonkin, produced $4,900, or over $2,000 above running expenses. This is certainly a good showing, and we have every reason to believe that the mine is now established upon a permanent-paying basis, and we expect to hear of large monthly yields from that source for all time to come.

Tuolumne.

WORK RESUMED.—*Union Democrat*, Oct. 18: The Lamphier mine, in which operations were suspended on account of a strike, will commence working again to-day, with a full force of men under the superintendency of William Symonds. The Lamphier is a very promising mine, having produced a large quantity of bullion in the past, and we are glad to note that operations are to be resumed. The mill will be run steadily from this time forward.

NEVADA.

Washoe District.

OHIR.—Virginia *Enterprise*, Oct. 18: Some ore is still being obtained on the 250 level. The drill hole from the face of the drift on the 500 level is drawing off the water very rapidly. The level probably be quite dry by the time the drift reaches it. On the 1500 level the south is being sent ahead at the rate of 60 ft per week.

BENTON.—The drift on the 2150 level is being pushed forward as fast as can be done without bringing out to much water. It will be yet about two weeks before the vein is reached. The water is handled with the pumps running about six strokes a minute on an average.

HALE AND NORCROSS.—The winze below the 2800 is being sunk very rapidly. It is now going for the 3000 level. There is no trouble on account of water, and sinking process at the rapid rate of 30 feet per week.

ALTA.—Steady progress is being made in the east drift on the 2150 level. It will yet be about two weeks before the vein is reached. Progress is slow for the reason that the ground is quite yet.

COMBINATION SHAFT.—The sump will be completed in a day or two, when the work will be commenced on the station at the 3000 level. The sump is being made about 50 ft deep, therefore will be capable of holding a great quantity of water in case of a flow being accidentally tapped at any point.

BEST AND BELCHER.—Good headway is making in the north drift on the 825 level. On this level several cross-cuts will presently be made and the ground thoroughly explored. The ground is everywhere perfectly dry and there will be no trouble about water at any point.

ANDES.—The west cross-cut from the main north drift is showing a large amount of quartz of excellent quality. The north drift has also shown good material. During the past week a considerable amount of work in the way of retimbering and repairing has been done on the main drift.

SAVAGE.—Good headway is making in the tunnel that is going in from E street. This will explore the vein at the depth of about 200 ft, where it is expected will be found the continuation of the body of ore now being mined in the Hale and Norcross. The rock is blasting well and the ground is perfectly dry.

YELLOW JACKET.—The old upper levels are still yielding a considerable amount of low-grade ore, and this yield may now gradually be increased with the increased volume of water in the Carson river. A good deal of prospecting is being done in various directions.

UNION CON.—The station at the 3300 level of the joint Ophir, Sierra Nevada and Mexican winze is now completed. The next work in order will be the running of a cross-cut to the west from this station. The water is handled without trouble.

BELCHER.—The amount of ore extracted is gradually being increased as the rise of water in the Carson river allows of the running of additional stamps. A considerable amount of prospecting work is being done.

ALPHA.—During the past week they have been working on the 900 level. The old west drift is being cleaned out and will reach the vein in a day or two, the distance from the shaft being about 250 feet.

SIERRA NEVADA.—The station at the 3300 level is completed, and preparations are being made for starting a west cross-cut. Repairs are being made to the winze between the 2300 and 2400 levels.

CON. VIRGINIA AND CALIFORNIA.—The northwest drift on the 1700 level is making good headway, and is in material of a very favorable appearance. Cross-cutting from this drift will soon be in order.

OVERMAN.—About 15 or 20 miners are employed in the old upper levels, and a considerable amount of ore is being extracted which is being crushed at the Vivian mill.

UTAH.—Very good progress is making in the southeast drift on the 1950 level. The rock is vein porphyry with some seams of quartz and streaks of clay.

CROWN POINT.—As the volume of water in the Carson river increases the amount of ore extracted is also increased. A considerable amount of exploring work is being done.

SCORPION.—The main north drift is making the usual progress. The rock is vein porphyry, with occasional streaks of clay and stringers of quartz.

Columbus District.

MOUNT DIABLO.—Candelaria *True Fissure*, Oct. 18: During the past week the incline has been sunk 11 ft and is now down 361 ft below the third level. The west drift on the fifth level has been driven 15 ft, and shows spots of low-grade ore. The north cross-cut from the drift is in 20 ft, and shows small seams of manganese ore. The west drift on the fourth level shows no change. In the intermediate, between the fourth and fifth levels, the west drift shows a little ore of low grade. The intermediate, between the third and fourth levels, and east of the shaft, shows a little good ore. There is no work being done above the third level, except in an intermediate east of the shaft, where a drift is being run for air connection.

Indian District.

MOONLIGHT MINING COMPANY.—*Silver State*, Oct. 20: A company has been organized here for the purpose of prospecting the Moonlight mine some seven or eight miles south of Unionville. Years ago the mine produced considerable ore that was worth over a dollar a pound, and the object of the new company is to prospect the mine below the old surface works in which that rich ore was found.

Secret Canyon District.

THE IRISH IMBASSINDER MINE.—Eureka *Sentinel*, Oct. 18: Richard Berryman and his brother Jim, son Jim and Charley Rudene are hard at work on the Irish Imbassinder mine, Secret canyon. They have made one good shipment of ore assorted from the dump, and have on hand about 200 sacks ready for another shipment. They have driven a hard-rock tunnel into the mountain and struck the ledge, are now raising on it, and will connect with the old works in a few days. There is a large quantity of waste rock in the mine which contains considerable ore. This will be run out through the tunnel and carefully assorted before any further prospecting is done.

Taylor District.

SUNRISE.—Cor. Eureka *Sentinel*, Oct. 18: The strike that was made a short time ago in the "Sunrise," one of the Argus group of mines, has developed into a large body of high grade ore, and the owners feel exceedingly jubilant in consequence.

White Pine District.

THE STAFFORD BONANZA.—White Pine *News*: Oct. 18: The Stafford Mine is located on the west side of Treasure Hill, some 200 yards below the main street of Treasure City, and has been worked, off and on, since 1869. Its shaft is an incline, and a whim, worked by horse-power, now does the hauling. An easy descent to the lower level was made on the incline ladder, which brought us to where the recent find was made. East and west drifts have been run, a distance of, we would judge, 100 feet in in both directions. The ledge is well defined, shows a regular foot-wall, and as far as prospected, gives a width of 27 feet, all in good milling ore. The dimensions of the ore body are yet unknown; on the east drift it is very strong in the face and going down. In the west drift they have started an uprise, from which they are taking out most of the present ore supply. From what we saw in both drifts, and a comparsion with the assay book at the company's office, we do not hesitate to say that the ore will mill at least $100 per ton. Many place it higher, but we believe this is a safe average. At present the work is being prosecuted under some disadvantage, as it is deemed necessary to get out sufficient ore to make a run before snow flies and the roads become impassable for hauling. When this occurs, Manager Robinson informs us, he will devote the winter months in following up his discovery and putting his hoisting works, tracks, etc., in condition to easily and systematically work the mine and handle the ore in the spring. The east drift which is now trending up the hill, and, if its course does not change, will pass close to the richest ground ever

worked on the hill, looks particularly well. The whole face of this drift is in good ore, pitching downward, and showing a well defined ledge. The work here at present is more to ascertain its extent than any intent to extract ore. Only that which is met with in running the drift is taken out. All the appearances at this point indicate a continuation of the vein and the big ore body.

ARIZONA.

COPPER.—Florence *Enterprise*, Oct. 10: The Ray copper Co. mines and works have been closed down for the present and the men discharged. It will probably be several months before work will be resumed. The cause of the "close-down" was the failure of the concentrating mill to perform the work expected of it. It was guaranteed by the manufacturers to concentrate 70 tons per day, and at the end of a ten day's trial it proved incapable of concentrating more than 25 tons per day. The ore being low grade, the mill must handle 70 tons per day in order to pay a good profit, and the company are determined to have a mill of that capacity, hence they are making arrangements for new machinery of the style recommended by Mr. Boucher before the present mill was ordered. The company's mines are all right and never looked better. They have immense ore reserves in sight, and there will be no question about the success of the enterprise when the proper machinery for the treatment of the ore is obtained. The present mill was a new experiment and should not have been tried at all. When mining companies learn to accept old and approved machinery for the treatment of ores, there will be fewer failures.

COPPER.—*Silver Belt*, Oct. 18: W. A. Holmes, who visited the San Carlos copper camp this week, reports matters as exceptionally lively there. Immense bodies of copper ore have been uncovered in the mine, in which 60 men are now employed. The new furnace will be started up about the 1st prox. The camp has been dubbed Cornwall.

SILVER MOUNTAIN.—Arizona *Miner*, Oct. 17: Recent developments south of the Tiger camp along Humbug Creek, and about the base of Silver Mountain, is attracting renewed interest in that direction, and we hope the time is not far distant when some company with sufficient means will open up the Mammoth and other monster lodes that appear to constitute the principal material of which the mountain is composed. It is the opinion of miners and prospectors, most familiar with the locality and formation of the country, that Silver Mountain is the great feeder and fountain that supplies Humbug Creek with its rich float rock and placer gold. The indications we are assured, all point to this and the countless spurs and stringers that radiate from the mountains, and which evidently have their base in the Mammoth lode, some of which have been successfully worked by arastra process, all tend to confirm this opinion. The Mammoth, as has often been noted in these columns, is the largest gold and silver bearing ledge or lode known to exist, either in Arizona or elsewhere, and as it shows mineral in paying values, in all the various openings along its course across the mountain for a distance of nearly two miles, it does seem that some company, having the means necessary to develop it, and see what it really contains below the surface, would be attracted to it. There is, perhaps, no undeveloped property in any mining camp in the United States that offers greater inducements to a company that is willing, by the expenditure of a moderate sum of money, to take the chance of realizing an enormous sum. If the property shall, upon being developed, prove to be what the prospects indicate, its value is beyond computation.

COLORADO.

PARK COUNTY MINES.—Alma *Bulletin*, Oct. 16: Shipments from the Great West continue heavy and regular. The Silver Gem shipped 11 tons of ore as last month's product. The Gertrude, on Mount Lincoln, sent down another small lot of fine ore recently. Some very fine ore from the Wheeler mine was crushed and sampled by Clark & Bagley this week. The leasers are still searching for ore on the Union claim and say they have no intention of giving it up. The Fanny Barrett leasers took out fair pay last month, although the work was carried on only about half the time. The leasers on the Great West divided up a large sized bundle among themselves this week, as profits for late ore sales. The Boston and Colorado works had about 100 tons of ore on hand when they comenced crushing yesterday morning. On the Como lode on Mount Bross, Lyman Fay, who is now sole owner, has discovered some ore, and feels confident of good pay ahead. The steam hoister on the Chicago shaft of the Sovereign mine is about ready to start up and will materially assist in the development of that part of the mine. Having secured control of the Ophir mine up Mosquito gulch, Mr. Danielson set to work at once taking out ore and is shipping to the Junction mill. The Ophir contains a strong vein of ore that runs particularly well in gold. If facilities for keeping the levels free of water are provided, the Ophir will unquestionably become a large producer. The indications are of a bright future for the Moose. On the territory known as the Chellew discovery, the Messrs. Chellew are at present working on an ore vein 20 inches thick and containing much high-grade mineral. The extent of territory which their lease controls makes it possible to them to secure a big bonanza if, as now appears possible, the vein holds for any distance, or leads to one of the famous Moose pockets of old times. A rumor has gained currency that the London mine and mill is to be started up again under the old management, the company having subscribed $150,000 to pay off all encumbrances and carry forward the work. The rumor does not bear sufficient authenticity to swear by, but is given for what it is worth. The Hawthorne place is located west of Quartzville and was recently claimed by Phillips & Co. They put in a couple of sluice boxes to do the assessment work on Thursday, and ran for a couple of hours with a small head of water and quicksilver. The gold secured amounted to one dollar which indicates good pay diggings. The peculiar vein of gold ore that was struck by A. K. Thompson in the cliff below the Moose mine, is heard from again. It will be remembered that Mr. Thompson had a small lot about 500 pounds crushed and sampled and offered for sale. The price tendered him is not definitely known, but it is stated to have been $26 for the lot. At any rate Mr. Thompson refused to sell it; took the ore home and has been crushing and panning it by hand. The result has been something over 14 ounces of gold, or about $230 worth, and as he was unable to take out the fine gold he still has the ore, which he figures is worth all that he was originally offered for it. One piece of gold which he took out of the lot weighed 12 grains. We do not believe there was any intentional dishonesty in the small offer, but it shows the futility of making ordinary assay tests on free gold ore. We are informed that Mr. Thompson has another lot of the ore taken out of the mine and sacked which he considers equally rich. The vein should be developed on a larger scale than he is able to do it.

IDAHO

NARROW GAUGE GULCH.—Wood River *Times*, Oct. 15: Superintendent Wilson, of the Narrow Gauge mines, was in town to-day, looking after the shipment of a carload of ore. This is the 17th carload of 12 to 20 tons each which he has shipped this year, and the mines and mill are in such shape that Mr. Wilson expects to be able to continue shipping right along, in future, summer and winter. There are about 25 men working in the Narrow Gauge mines and mill, but only two of these work in the mill, as it is so conveniently arranged that two men on a shift suffice to look after it. It has a capacity of 20 tons per day of 20 hours. The Narrow Gauge ore averages 130 to 140 ounces silver, and 60 per cent lead. The French Boys recently shipped 20 tons of ore from their claims, in the same gulch. It yielded 93 ounces per ton in silver, and 56½ per cent. in lead. They are getting ready to work all winter. Holding work is being done on the Walla Walla, Robert Emmett, Forest Creek, and other claims in the gulch.

THE SMOKY DISTRICTS. Wood River *Times*, Oct. 15: Ed. Penberthy, of the Smoky districts, is in town. The news he brings from Smoky is very encouraging, and to the effect that the district will never fail to come up to the front with its quota of high grade ores. The mines and prospects there are all looking well, and the output this fall will exceed that of any preceding season fully one-half. Last Thursday James McElhaney made a small shipment of $250 ore from his prospect, the King of the West, and yesterday James McCarter sent down ten tons of high-grade galena. Sam J. Friend also has several tons of fine ore on the dump, that will be shipped to-day or to-morrow. Several other prospects are developing well, from which small shipments will be made this fall, to be converted into a grubstake for the winter. All the old established mines are looking well, and preparations are being made to continue work all winter. Smoky will send a large number of specimens to the New Orleans Exposition, some of them being the finest sent from this Territory.

GOOD PROSPECTS.—*News-Miner*, Oct. 16: Hugo Bayhouse, William Bayhouse, Prof. George Delius and several others are interested in two claims in the Lava Creek mining district, which are promising prospects. They were located only a few days ago. One of them is an extension of the Horn Silver claim, and assays just made run over 2,000 ounces per ton. Some of the best pieces of ore show from $5,000 to $8,000 per ton. Hugo Bayhouse has gone to Boise City on business, but will return in a week or two. Preparations will be made to work these mines next spring, and perhaps they may be started up this fall.

BROADFORD.—Wood River *Times*, Oct. 15: There is perhaps at present no town on Wood River that has so bright prospects for the immediate future, or in whose prosperity there is so much confidence expressed, both by residents and those doing business there, as has the little town of Broadford. Broadford, but a few short months since a small prospectors' camp, is now a flourishing little city, whose inhabitants number all of 600. Two months ago, before the new mill of the Queen of the Hills was put into operation, the town had but few permanent residents, being simply a boarding and lodging place for miners who lived in Bellevue and other places near by, but who could not go home to spend their hours "off shift." But the recent developments in the mines there have been so encouraging as to induce a large influx of population, and the town is springing up like a mushroom. The resources of Broadford until recently have been limited to the business from the two or three mines in operation there and the prospects adjacent. But developments this fall have been so encouraging as to warrant the working of a large force on the mines and most of the prospects, and this has caused a merited boom in every branch of trade.

MONTANA.

TIDAL WAVE DISTRICT.—Butte *Miner*, Oct. 15: From a private letter received yesterday we learn that Messrs. Gideon and Root are in high spirits over the recent important strike made in the Tidal Wave mine. The main vein has been struck, and at last accounts was nine and one-half inches thick. Sixteen inches of their ledge will assay away up in the hundreds and the remainder will average about 75 ounces. This will be good news to a number of parties in Butte who own and have been staying with leads in that district for the past two years, as this discovery develops the fact that there is a true fissure vein in the district. Heretofore all the ore taken out of the mines has been found in pockets.

BUTTE.—*Inter-Mountain*, Oct. 18: We had occasion a few weeks ago to note the unusually large number of new claims that were being developed, in a small way, and a recent trip to the mills at which custom ore is treated elicits the fact that the quality of ore being brought in for treatment is of an unusually high-grade. The assay value has undergone a marked increase, and many claims from which ore averaging from $30 to $50 per ton has been shipped in the past now yield increased amounts of a value running from $50 to $100. This increase in value is due to some extent to the more careful sorting of the ore, but we think the greater depth attained in the claims in the most important factor in raising the average value of the product. As to the increased amount of ore brought in for treatment, the point is being explained in a great many instances by the fact that the increased means placed in the hands of small operators as the profits accruing from the working of ore is used in the purchase of increased facilities for further extraction and the employment of a greater number of hands. Thus a greater number of claims which but a short time ago gave employment only to the owners or the men who were operating the property under lease, now are operated by from three or four up to eight or ten hands.

LEXINGTON.—At the Lexington the usual grade of ore is being extracted from all the stopes and levels.

ALICE.—At the Alice, Supt. Hall is busy with his preparations for the new pump. On the 400 ft level a new strike on the south vein is showing up in good shape. The timbers for the new pump building, which is to be 30x100 ft, will be ready to put up at shortest notice when all is ready for it.

CLARK'S COLUSA.—The fine body of ore recently opened up on the 400 ft level continues to yield handsomely, and the other stopes and levels are in a most satisfactory condition. The concentrator is working finely, the annoyances incident to the starting of new machinery being met and overcome. The work on the new smelter is being carried forward.

NEPTUNE.—This property, owned by W. A. Clark, and situated west of the Stevens, is being opened up in a most satisfactory manner. The main shaft has now attained a depth of 125 ft, above which point a cross-cut was run a distance of 30 ft to the vein, which showed a considerable increase in width over that which was developed higher up. Stoping will commence, when it is expected that about 10 tons per day will be taken out and shipped to the mill.

BELL.—Matters at the Bell are progressing in the usual routine, operations being now centered on the 500-ft level, on which drifts are being run east and west. At the smelter things are about as usual, the capacity of the furnace—80 tons per day—being treated every 24 hours.

NOTES.—Operations on the Wild Bill have been resumed, the pumps now being at work. The property has been leased to Ed. Breus & Co. Sinking on the Poser is still progressing. The 200-ft level not being as yet reached. Considerable ore has been shippped to the mill, the average value of which is about $70. In the Rock Island at a depth of 200 ft they have encountered a 5-ft vein of good rock, 2 ft of which assays $100 and the balance being valued at $50. The Marie continues to produce ore valued at from $75 to $100, shipments of which will soon be made to the mill. The Champion, owned by John A. Leggatt, situated west of the Big Butte, yesterday commenced shipping ore to the mill.

NEW MEXICO.

MICA.—Santa Fe *Review*, Oct. 16: The splendid mica deposits of Santa Fe and Rio Arriba counties have grown into great public interest since the operators in this industry have become convinced that the mica mines of North Carolina are nearly exhausted. The demand for mica—the many uses to which it can be put—is now greater than ever before; the trade must be supplied from some source, hence the popularity into which the deposits in this vicinity have suddenly jumped. It is a fact not generally known that the rich hardware firms of Chicago and Milwaukee who have of late commenced operating hereabouts on a large scale, are the very men who furnished the capital for working the North Carolina mica beds, but it is so. The Cribbenville mines, called after the Chicago firm of Cribben & Co., are owned by the identical parties, and it is refreshing to know that they are so well pleased with the time and money they have thus far expended here. In conversation with their superintendent, C. J. Pearce, the *Reviewer* was shown an extract from a letter of the Chicago firm expressing the utmost satisfaction with the product of the mica mines adjacent to Santa Fe, advising him to increase his working force and make as large shipments as possible before the snow flies, for fear the market supply may be cut short. It is said by those who claim to know that the product of the Cribbenville mines is of the best quality ever discovered in this country, and it is noted with no little degree of pride that in Santa Fe county there are a dozen fairly developed mica properties equally as good.

NOTES.—Silver City *Enterprise*, Oct. 18: Old placer diggings have been discovered east of Pleasanton, in the Mogollons. The new district of Gold Hill is still the attraction for prospectors in this section. Most encouraging reports are being received from there. A good sized body of rich ore was recently struck in the Cariboo mine, at Fleming. This is the property that was recently purchased by Mr. D. Jackson. Jack McKee and Bart Downey have made a rich strike in Apache district. The vein is about eighteen inches wide and averages 300 ounces. They have a carload of ore ready for shipment. The King mine, in Eureka district, has closed down. The main shaft, which is 410 ft deep, contains about 200 ft of water. It will be turned into a stock company and work resumed in a short time. Edward Copley has retired from the superintendency of the Old Man Mining company. The position is now filled by Joe McDonald, the old foreman of the mine. John Mullen has been installed as foreman. The Rob Roy mines, of the Penrose group, at Fleming, is showing up some fine ore. The development of the property is being steadily pushed forward. Favorable reports come in of the progress of development upon the Black Hawk mines. The characteristic rich ore for which the mine is noted has been exposed in several openings during the past month. The new management appear satisfied with the amount of ore taken out since the first of August and intend prospecting with renewed energy during the present month. The Sunday and Income mines, at Fleming, were recently bonded by D. Jackson, for 30 days. Mr. Jackson is now in Denver making arrangements for the purchase money. A force of men has been placed upon the Rose mine, at Bullard's Peak, and if they are allowed to work by the contending claimants, will take out ore that will surprise the natives. This claim is one of the richest surface locations ever discovered in New Mexico, but unfortunately has been in litigation since the discovery of rich mineral upon it nearly a year ago. Capt. M. Cooney and Judge Bunn visited the new camp in the Mogollons last week and took part in the meeting for the organization of the district, which was named Wilcox, in honor of the first prospector who discovered mineral there. The Silver Trumpet mine, in the Gold Gulch district, owned by Messrs. Brown, Malone and Donohoe, is turning out some excellent grade ore, a car of which is on the dump, sacked and ready for shipment. An experimental test on Cooney ore was recently made by I. E. James, superintendent of the Carlisle mine, on the Duncan concentrators, with very satisfactory results. But a small quantity was treated at the time and that was worked with a loss of but two per cent. When it will be remembered that assays running as high as five ounces in gold have been obtained from the Cooney mill tails, the result of the experiment will be appreciated. The prospecting of the Old Man vein during the past 10 days has developed some fine ore. In the lowest point yet reached in the mine, mineral of an extra high grade is being taken out and the showing is better than at any exposure of mineral thus far made in the mine. The usual grade from the open-cut continues to be taken out. Four cars per month are being shipped to Pueblo for treatment, while the low grade ore continues to increase the mammoth dump which already contains many thousands of tons. The discovery made on Big Dry Creek, eleven miles east of Pleasanton, in the Mogollons, is said to be a most important one. Specimens of the ore have been sent to this office by R. E. Allered, one of the discoverers of the mineral. The ledge is said to be an immense one, from eight to twelve ft in width, and traceable for 6,000 ft.

UTAH.

FRISCO.—Southern Utah *Times*, Oct. 18: The Grampion, one of the oldest claims of the district, with ore in sight and quite a shipment on the dump, is now idle. This is an Eastern corporation, but for some reason unknown to us, this mine remains untouched, though the output was and is sufficient to pay 20 per cent on the original investment. The Americus and Lulu companies are also inactive; the hoisting works on both properties, amply capable of handling the work at hand, yet are allowed to rust while the wind whistles down the smokeless stacks. The same may be said of the Young America, though these mines are situated south and southwest and close up to the Horn Silver. The Morse, Jayhawker, Dick Taylor and others on the north end are being held by assessment work, while the showing in all of these would send Idaho and Montana miners wild. For reasonable men to suppose it possible that a well-defined contact vein, traced for miles, showing pay ore in nearly every opening made, should not improve by further development, passes belief. The Horn Silver improves with depth, and the workings before many months will soon pass outside its own boundaries. The ground into which the present ore bodies lead is now idle, though the expenditure of a few thousand dollars would, years since, have produced millions of dollars for the plucky investors. This may seem to be an exaggeration, but sterling facts recently brought to light in Park City completely sets this matter at rest. The Ontario mine, we were told by those wise-acres who could see right down into the earth, was the only mine in Uintah district. Owners of property adjoining the Ontario could not dispose of a foot of ground for love or money, and whenever one of them managed to make a sale, the proceeds were secured as a donation—a sort of a charitable transaction. J. J. Daly finally saw his opening and quietly purchased all the property immediately west, and has demonstrated the fact, long known to practical miners, that the ore was not all confined within the Ontario lines, and the mines which were bought a few years ago for a song could not now be had for several millions. To bring the case nearer home, the Horn Silver Company, a few years since, got hold of the North Extension for about $12,000. Is there a mining man in this camp to-day who imagines that he could buy that property for $250,000? We have not seen him. Unlike other sections of the West, this is not a played-out camp. In fact, the game has not yet been started here. True, the mighty pulsations of the Horn Silver, throwing out from the warm heart of the San Francisco mountains $70,000 per week from one mine, would seem to satisfy the most ambitious mining community on the coast, but when we know that to the south and north are ore bodies yet untouched, we feel it our duty to inform the capitalist of that fact.

STAR STRIKE.—Southern Utah *Times*, Oct. 18: Don Wickizer recently went to work upon a favorable-looking location, which he designated the Don, where, at a depth of 13 ft, he struck an 18-inch vein of chloride ore assaying 522 ounces silver and 52 per cent lead. The formation is granite and lime, and the indications point to the opening of a big bullion bearer. At the Carbonate camp work is progressing with the old-time vigor, and the outlook for the Frisco Mining & Smelting Co.'s property is better than ever. Superintendent Davis has let a new contract on the working shaft to Messrs. Nelson & Susette, and the work of sinking will be begun immediately, and the shaft sunk to the depth of the 200-ft winze, now down about 130 ft in good ore all the way. Operations at the concentrating works will be resumed in a few days, and two more carloads of high-grade concentrations will be added to this month's shipment, making in all four carloads for reduction at the Germania works. This company's other bonanza, the Cave, is daily developing beyond all precedent, and proving a wealth producer of which Beaver county may well be proud.

WASHINGTON.

CLE-EL-UM.—Cor. Kittitas *Localizer* Oct. 10: The Cle-el-um mines have thus far been discovered and developed by men who are not afraid to adapt their small means and muscle to open their mines in such a shape as to make them pay by working them on the ground with small machinery; or by sorting the rock closely and shipping it to reduction works. If we go ahead and develop our property, we need not hunt for imaginary names to attach to samples of ore and ship it to New York, Boston or Paris or some other famous seaport, and by that means try to create one of those things called a boom. For if we sink shafts and demonstrate that we have good mines that will prove to be good paying property, we can find moneyed men in our own country who will be only too glad to invest their money in our mines. Had the Tacoma company been fortunate enough to have employed a competent man to superintend their mines, ere this the camp would have been opened and a quartz mill in operation on rock that is sure to pay.

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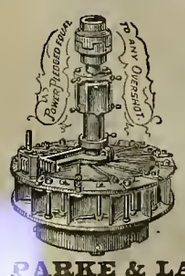

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Economy in space and fuel. Safety at high pressures. Freedom from scaling. Equally adapted for power and heating purposes. Especially adapted for mills, factories, hotels, stores or any place where safety is a necessity. Will work well with muddy water and any kind of fuel.

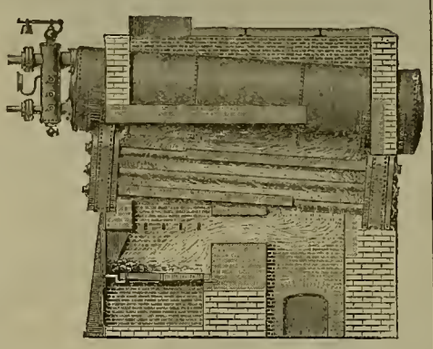
TESTIMONIALS.

SAN FRANCISCO, Sept, 19, 1884.

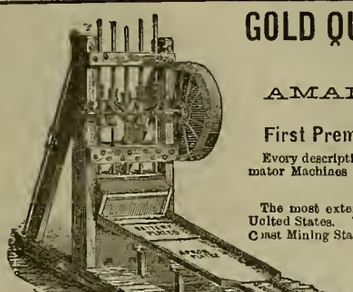
Risdon Iron and Locomotive Works—Gentlemen: We have had one of your Heine Patent Safety Boilers in use for four months at our Borax Works, in Alameda. It does good work and gives perfect satisfaction. Yours truly,
(Signed) WM. T. COLEMAN & CO.

SAN FRANCISCO, Oct. 4, 1884.

Risdon Iron and Locomotive Works—Dear Sirs: I am using one of your Heine Patent Safety Boilers in my Candy Factory on Twenty Third street, near Valencia. For economy of fuel, safety and efficiency I have never seen its equal. Very truly yours,
(Signed) W. S. TOWNSEND.



Send for Circular and Prices.



GOLD QUARTZ and PLACER MINERS.

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For Saving Gold.
First Premium Awarded at Mechanics' Fair, 1884.

Every description of plates for Quartz Mills and Wet or Dry Placer Amalgamator Machines made to order, corrugated or plain.
OVER 2,000 ORDERS FILLED.

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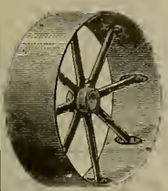
Old Mining Plates Replated. Old Plates bought or gold separated for low percentage of result.

SEND FOR PRICE LIST.

SAN FRANCISCO PLATING WORKS,
653 & 655 Mission St., San Francisco Cal
E. G. DENNISTON, Proprietor.



PERFECT PULLEYS

First Premium Awarded at Mechanics' Fair, 1884.
CLOT & MEESE,
Sole Licensed Manufacturers of the
Medart Patent Wrought Rim Pulley
For the States of California, Oregon and Nevada, and the Territories of Idaho, Washington Montana, Wyoming, Utah and Arizona. Lightest, Strongest, Cheapest and Best Balanced Pulley in the World. Also Manufacturers of
SHAFTING, HANGERS AND APPURTENANCES.
☞ SEND FOR CIRCULAR AND PRICE LIST. ☜
Nos 129 and 131 Fremont Street - - - SAN FRANCISCO, CAL.

CHILLED CAR WHEELS.

Medal Awarded, Mechanics' Fair, 1882.
STEIGER & KERR, Occidental Foundry,
No. 137 FIRST STREET, SAN FRANCISCO, CAL.
☞ IRON CASTINGS OF ALL DESCRIPTIONS.

CALIFORNIA ARTIFICIAL STONE PAVING COMPANY,

No. 404 Montgomery Street, San Francisco.
FIRST PREMIUM AWARDED AT MECHANICS' FAIR, (S. F.) 1884,
For ARTIFICIAL STONE PAVEMENT.

A. T. DEWEY.
W. B. EWER.
GEO. H. STRONG. } **Dewey & Co.'s Scientific Press Patent Agency** { ESTABLISHED 1860.

INVENTORS on the Pacific Coast will find it greatly to their advantage to consult this old, experienced, first-class Agency. We have able and trustworthy Associates and Agents in Washington and the capital cities of the principal nations of the world. In connection with our editorial, scientific and Patent Law Library, and record of original cases in our office, we have other advantages far beyond those which can be offered home inventors by other agencies. The information accumulated through long and careful practice before the Office, and the frequent examination of Patents already granted, for the purpose of determining the patentability of inventions brought before us, enables us often to give advice which will save inventors the expense of applying for Patents upon inventions which are not new. Circulars of advice sent free on receipt of postage. Address DEWEY & CO., Patent Agents, 252 Market St., S.

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— AT —
Mechanics' Fair, 1883 & 1884
— FOR —
Automatic Cut-Off Engine.
SILVER MEDAL AWARDED
—1883—
For Best Hoisting Engine and Boiler Combined.

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Practical, Civil, Mechanical and Mining Engineering,
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WM. BREDEMEYER,

Mining, Consulting and Civil Engineer,
Room 11, Hooper & Eldridge's Bl'd'g, Main St.,
SALT LAKE CITY, UTAH.

UNITED STATES MINERAL SURVEYOR for Utah and Idaho. Notary Public. Geological Examinations, Reports on Mining Properties, Surveys Mines, Railroads and Canals, and Superintends the workings of the same. Prepares Estimates and Plans for Opening and Working Mines, Expert on Mining Questions before the Courts. Address P. O. box 1157, Salt Lake City, Utah.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,
Manufactory, 17 & 19 Fremont St., S. F.

A Great Triumph!

WON BY THE MANUFACTURERS OF THE
EUREKA CEMENT,
GOULD & HILL, Proprietors,
103 and 105 Fremont St., San Francisco.

On the 25th day of August, 1884, Judge Sabin, of the United States Court of Equity, decided the great infringement case of the Salamanda Felting Company of New York and Philadelphia vs. the EUREKA CEMENT, in favor of the EUREKA CEMENT. This decision is one of the most important that has been rendered for many years, because it gives Messrs. GOULD & HILL the unrestrained right to continue the manufacture of the BEST COVERING FOR STEAM BOILERS AND PIPES that is known to the world

RICHARD C. REMMEY, Agent,
Philadelphia Chemical Stoneware Manufactory,
1100 East Cumberland St., PHILADELPHIA, PA.

Manufacturer of all kinds of Chemical Stoneware
—FOR—
Manufacturing Chemists.
Also Chemica Brick for Glover Tower

The California Perforating Screen Co.
Al kinds of Quartz Screens, slot or round holes; zinc, copper and brass for flour and other mills. BOOK & WAGNER, 123 and 125 Beale St., S. F.

SURVEYORS—INVENTORS.

A. SCHURCH, Mathematical Instrument and Model Maker, 335 Bush street, S. F. Scientific Apparatus and Experimental Machinery at short notice.

Lead Mining in Nevada.

During the past year very extensive experiments have been made upon working the speiss of the Eureka Consolidated mine, in Nevada. There are on the furnace dumps some 50,000 tons of this material, with an assay value of about $20 per ton. From the result of these experiments it has been found that there is no question as to the profitable working of the speiss, and Mr. Thomas J. Read, the Superintendent, in his annual report to the company, presented this week, recommends the erection of a suitable plant for this work. It is probable, therefore, that the speiss will be worked.

During the past year 14,144.3 tons of ore have been worked at the Eureka Consolidated Company s furnaees, yielding 1,397.3 tons of bullion; gross value in gold and silver of $484,420.94. Of the ore reduced, 3,295 tons were custom ore. At the mine, 3,670 feet of drills have been run, aud about 2,205 feet of raises and winzes.

About 60 men have been at work in the mine upon the tribute system. No important developments have been made duriug the year, but sufficient ore has been purchased to keep one furnace running. About the 1st of September a good body of ore was opeued from what is kuown as the Sentinel cut, 50 feet below the surface. This now shows a body of high-grade ore, eight feet in width, running into unprospected ground. The other bodies now being worked show no partieular ehauge. The yield of the mine and the ore prospect are as good as at any time during the past year. The Eureka Consolidated mine has been one of the largest producing mines in Nevada for some years past. Almost the entire product of lead in Nevada comes from Eureka District, where the Eureka Consolidated aud the Riehmoud Companies are operated. The largest product ever made was in 1878, when the yield of the camp was 31,063 tons of lead. Since that time the yield has gradually fallen of. The ore occurs in large chambers, and the mines have, therefore, periods of great prosperity, alternated with others when extensive development aud prospectiug work must be earried on.

Manufacture of Concrete.

Ernest L. Rausoine, the well kuowu manufacturer of couerete and artificial stoue, of this eity, has patented, through the MINING AND SCIENTIFIC PRESS Patent Ageney, certain improvements in the manufacture of concrete, in which he mixes the materials dry, and adds water gradually while the operation is continued, until the mixing is sufficiently intimate and complete.

Mr. Ransome provides a mixing box in the form of a hollow cube mounted on trunnions secured to opposite coruers. Above the center of the hox is a hopper, with its discharge opeuing at such a point that au opening in the side of the box may be made to stand directly heneath the hopper when the hox is turned to the proper position, aud by opening the hopper gate and the cover of the hox a charge suitable for making the concrete may be let in. The box is theu elosed, and revolved slowly to mix the material.

One or both of the trunnions are made hollow, and a perforated pipe extends into and across the box inside, to admit the water. The hox heing ouly partially filled with the materials for a charge, the latter will slide down continually as the hox revolves, exposing new surfaces to the pipe heneath which it moves. The water pipe may be fixed, or allowed to revolve with the mixing box. Where a tank is used for supply, the outer end of the pipe is bent so as to dip at each revolution of the box into the water or other liquor—such as lime water—the water or liquor thus dipped up by the pipe thus discharging a small quantity intermittingly into the mass until it is sufficiently moistened aud mixed. More thau one arm ean be made to the pipe, as desired, so as to scoop up more or less water at each revolution, to suit the neces ities of the mixing.

THERE are vast amounts of mining property, with titles all perfeeted and United States patents obtained on most of the mines, owned by people in the East, who are patiently waiting for a railroad to pass through this country, thus enabling them to work their mines at a profit. —*Pioche Record.*

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M & M Co	Alaska	8	70	Oct 14	Nov 15	Dec 5	E F Stone, 305 Pine st
Arnold G & S M Co	Arizona	2	50	Aug 1	Oct 1	Oct 28	A Judson, 320 Sansome st
Andes M Co	Nevada	25	25	Sept 23	Oct 23	Nov 20	B Burris, 309 Montgomery st
Butte Creek Hyd M Co	California	10	10	Sept 23	Nov 6	Nov 29	R L Taylor, 230 Montgomery st
Cheva Santa M Co	Mexico	3	05	Sept 13	Oct 15	Oct 31	W L Oliver, 328 Montgomery st
Con Imperial S M Co	Nevada	21	10	Sept 1	Oct 7	Oct 23	C L McCoy, 309 Montgomery st
Caborca M Co	Mexico	9	03	July 18	Nov 1	Dec 1	C Bovie, 328 Montgomery st
Daisy Cement M Co	California	2	02	Sept 26	Nov 8	Nov 29	C J Collins, 512 Montgomery st
Day S M Co	Nevada	15	75	Sept 26	Nov 3	Dec 2	E M Hall, 327 Pine st
Excelsior W & M Co	California	7	50	Sept 2	Oct 7	Oct 28	W J Stewart, 215 Sansome st
Eintracht Gravel M Co	California	16	05	Aug 26	Sept 1	Oct 18	H Kunz, 209 Sansome st
Golden Fleece G M Co	California	34	40.00	Oct 13	Nov 18	Dec 8	F Schirmeier, 412 Sixth st
Indian Spring Drift M Co	California	3	03	Sept 17	Oct 18	Nov 15	A B Paul, 328 Montgomery st
Justice M Co	Nevada	41	15	Sept 11	Oct 14	Nov 5	R E Kelly, 412 California st
Lamphire G M & M Co	California	1	10	Oct 3	Nov 17	Dec 8	A Martin, 526 Montgomery st
Peerless M Co	Arizona	2	25	Sept 25	Nov 3	Nov 29	A Waterman, 309 Montgomery st
Sierra Nevada S M Co	Nevada	80	50	Oct 22	Nov 26	Dec 25	E L Parker, 309 Montgomery st
Solid Silver M Co	Nevada	4	16	Sept 23	Oct 25	Nov 12	R Hewson, 5 First st
Sterling M Co	California	1	05	Sept 18	Oct 23	Nov 20	W H Allen, 306 Pine st
Savage M Co	Nevada	60	50	Sept 5	Oct 7	Oct 27	E B Holmes, 309 Montgomery st
Tunitas Petroleum Co	California	2	1.00	Sept 29	Oct 31	Nov 15	S P Springer, 601 California st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	Annual	Oct 27
Fremont M and M Co		M T Ashby	302 Front st	Annual	Nov 11
Homeward Bound Plt'r M Co	California	D A Smith	209 Post st	Annual	Oct 24
Happy Valley M Co	California	D M Kent	330 Pine st	Annual	Oct 20
Trinity G M Co	California	J M Leffridge	523 California st	Annual	Oct 29

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	G W Sessions	309 Montgomery st	50	June 5
Darbee Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Oct 8
Idaho M Co	California			4.00	Apr 2
Jackson M Co	California	D C Bates	309 Montgomery st	10	Mar 16
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 21
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Apr 28
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Mar 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Sept 5

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 2.		WEEK ENDING Oct. 9.		WEEK ENDING Oct. 16.		WEEK ENDING Oct. 23.	
Alpha	1.45	1.95	1.40	1.60	....	1.25	1.25	1.40
Alta	1.90	2.10	1.55	1.95	1.65	1.75	1.60	1.90
Andes	.10	.15	.10	.15	....	.10	.05	.10
Argenta	....	....	....	....	....	....	....	....
Belcher	.90	1.00	.85	.90	....	.80	....	.85
Belding	....	....	....	....	....	....	....	....
Best & Belcher	1.85	2.20	1.60	1.95	1.75	1.85	1.50	1.80
Bullion	....	.40	.25	.30	....	.25	.30	.25
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	.50	.55	.40	.50	.40	.45	.35	.55
Bodie Con	2.00	2.40	2.05	2.35	2.10	2.20	2.10	3.05
Benton	.45	.50	.40	.50	....	.50	.50	.55
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	.50	.65	.60	.65	....	.65	.55	.80
California	....	.30	.35	.40	.35	.40	.35	.55
Challenge	....	.20	.20	.25	....	....	.20	.25
Champion	....	....	....	....	....	....	....	....
Chollar	2.10	2.35	2.05	2.15	2.00	2.15	2.00	2.50
Confidence	....	1.20	1.00	1.25	....	....	....	....
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	....	.20	.15	.25	.15	.20	.35	.40
Con. Pacific	.50	.65	.60	.90	.80	1.00	....	.85
Crown Point	1.20	1.50	1.40	1.60	....	1.35	1.35	1.45
Day	....	.05	....	.05	....	....	....	....
Eureka Con	....	3.00	2.90	3.10	3.10	3.20	2.10	2.75
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	.25	.35	.25	.35	....	.25	.10	.35
Grand Prize	.35	.40	.30	.40	.25	.35	.25	1.25
Gould & Curry	1.40	1.30	1.20	1.45	1.15	1.20	1.00	1.25
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	2.85	3.05	2.50	2.90	2.45	2.75	2.70	3.30
Holmes	2.75	3.00	2.50	3.50	3.05	4.00	3.00	3.25
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	.10	.15	.10	.15	....	.10	.20	.25
Martin White	....	.50	....	.30	....	.40	....	.40
Mono	1.30	2.00	1.35	1.80	1.50	1.65	1.50	2.00
Mexican	1.50	1.70	1.20	1.55	1.20	1.35	.90	1.20
Mt. Diablo	2.40	3.00	3.00	3.25	3.25	3.50	3.40	3.75
Northern Belle	....	....	....	....	....	....	....	....
Navajo	3.00	3.60	3.55	3.60	3.60	3.75	3.35	3.55
North Belle Isle	.35	.40	.40	.45	....	.45	.50	.60
Occidental	....	1.25	1.10	1.25	1.20	1.25	1.35	1.50
Ophir	1.15	1.30	1.05	1.20	.80	1.10	.75	.95
Overman	....	.15	.15	.20	....	.15	.15	.20
Potosi	....	1.35	1.15	1.25	1.00	1.10	1.05	1.50
Final Con	....	....	....	....	....	....	....	....
Savage	1.00	1.20	.85	1.35	1.25	1.30	1.25	1.40
Seg. Belcher	....	....	....	....	....	....	....	1.00
Sierra Nevada	1.35	1.50	1.25	1.40	1.05	1.30	.85	1.25
Silver Hill	....	....	....	....	....	....	....	....
Silver King	....	4.25	4.10	4.25	....	....	....	4.15
Scorpion	.20	.25	.20	.25	....	.15	.15	.60
Syndicate	.45	.50	....	.45	....	.50	.60	.65
Tioga	....	....	....	....	....	....	....	....
Union Con	1.15	1.30	1.05	1.20	....	1.05	.80	1.10
Utah	1.10	1.40	1.05	1.20	.80	1.00	.60	.90
Yellow Jacket	1.75	2.00	1.80	2.00	1.65	1.90	1.70	1.85
	....	....	....	....	....	....	....	....

Meetings and Elections.

EUREKA CONSOLIDATED M. Co., Oct. 20. Directors, J. C. McKenzie (President), C. A. McKenzie, Gustav Frank, P. M. Lundenthal and Wm. Fries; Secretary, E. H. Wilson.

EXCHEQUER M. Co., Oct. 20. Directors, J. B. Russell (President), C. Hirshfeldt (Vice-President), N. Reyfish, W. S. Hobert and A. Jackson. Charles Elliot was continued as Secretary and A. C. Hamilton as Superintendent. All outstanding obligations had been paid up to October 1st, and there remained in the treasury $6,782.88.

SYNDICATE M. Co., Oct. 16. Directors, Charles H. Fish (President), George W. Hopkins (Vice-President), H. M. Yerington, R. N. Graves and W. R. Sherwood. The cash on hand amounted to $13,240.83. M. J. Stadtfelt, Jr., was re-elected Secretary and H. M. Yerington, Treasurer.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
J. J. BARTELL—Sacramento Co.
A. C. KNOX—Nevada (State).
R. W. CROWELL—Fresno and Tulare counties.
GEO. MCDOWELL—Amador and Calaveras counties.
WM. PASCOE—San Francisco.
WM. H. COOK—Los Angeles Co.
H. G. PARSONS—Montana and Utah.
G. W. INGALLS—Arizona.
D. K. BRAMBLE—Humboldt and Del Norte Co.

THE Father de Smet mine of Dakota produced about $49,000 in August.

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Oct. 23.

250	Alpha	1.30	
800	Alta	1.65	
150	Andes	.05c	
100	Bodie	2.80@2.85	
820	B. & Belcher	1.70@1.75	
150	Bulwer	.75c	
50	Chollar	2.30	
243	Con. Virginia	40c	
300	Exchequer	.25c	
500	Gould & Curry	1.10@1.15	
1450	Hale & Nor	.3.05@3.10	
275	Mexican	1.00	
250	Ophir	.80c	
50	Occidental	1.45	
500	Potosi	1.20	
600	Sierra Nevada	.95c@1.00	
100	Syndicate	.55c	
400	Scorpion	.15c	
300	Union	.95c	
130	Utah	.75c	

AFTERNOON SESSION.

100	Andes	.08c
300	Alpha	1.45
170	B. & Belcher	1.85
450	Belcher	.75@.80c
150	Bodie Con	2.75@2.80
580	Chollar	2.30@2.40
350	Champion	.40c
300	Exchequer	.25c
500	Gould & Curry	1.25@2.30
100	Hale & Nor	3.15
550	Mexican	1.05@1.10
450	Ophir	.87½@88c
200	Overman	.19@.20c
100	Syndicate	.55c
120	Sierra Nevada	1.05
300	Utah	.75@.80c
300	Union	.98@.99c

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Oct. 23, 1884.

ANTIMONY—Per pound		@ —
Hallet's	13	@ —
Cookson's	14	@ —
BORAX—Refined	7½	@ 8
IRON—Glengarnock ton	25 00	@ —
Eglinton, ton	24 00	@ —
American Soft, ton	25 50	@ —
Oregon Pig, ton	—	@ —
Clipper Gap, Nos. 1 to 4	30 00	@32 50
Clay Lane White	22 00	@ —
Shotts, No. 1	26 00	@ —
Refined Bar	3	@ 5½
Boiler, 1 to 4	5 00	@ 5 50
Plate, 5 to 10	4½	@ 4¾
Nail Rod	7	@ —
Norway, according to thickness	6	@ 7
STEEL—English, lb	16	@ 25
Black Diamond, ordinary sizes	13	@ —
Drill	15	@ —
Machinery	12	@ 14
COPPER—Ingot	14	@ 15
Braziers' sizes	7	@ 37
Fire-box sheets	28	@ —
Bolt	23	@ 25
Bar		@ —
Cement, 100 fine	12	@ —
Copper in New York, Oct. 22	12½	@ —
LEAD—Pig	3½	@ 4
Bar	5¾	@ —
Pipe	7	@ —
Sheet	8	@ —
Shot, discount 10% on 500 lbs s: Drop, ¾ bag	1 85	@ —
Buck, ¾ bag	2 05	@ —
Chilled, do	2 25	@ —
TIN PLATES—Charcoal	5 28	@ 7 25
Coke	5 75	@ 6 75
Pig	19 00	@20 00
Banca tin	22	@ 23
I. C. Charcoal R oofing, 14x20	6 25	@ 6 50
ZINC—German	9	@ 10
Sheet, 7x3 ft, 7 to 10 lb, less the cask	9	@ 10
QUICKSILVER—By the flask	30 00	@ —
Flasks, new	1 05	@ —
Flasks, old	85	@ —

Mining Books.

Orders for Mining and Scientific Books in general will be supplied through this offices at pub lished rates.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.]

FOR WEEK ENDING OCTOBER 14, 1884.

306,580.—DREDGING MACHINE—E. Chaquette, S. F.
306,397.—ROLLER SKATE—W. B. Higgins, S. F.
306,633.—FRUIT JAR HOLDER—L. H. Moise, S. F.
306,522.—CONCRETE—E. L. Ransome, S. F.
306,428.—LIFE SAVING RAFT—A. E. Redstone, S. F.
306,534.—GATE—Geo. W. Scott, Lemoore, Cal.
306,541.—ENGINE GOVERNOR—J. P. Simmons, S. F.
306,542.—LUBRICATING CUP—J. T. Smith, S. F.
306,553.—CANNISTER—J. H. Tingman, S. F.
306,666.—GRAIN SPREADER, ETC.—Jas. T. Watkins, S. F.
306,667.—HORSE HAY FORK—Jas. T. Watkins, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Mining Share Market.

Business continues light in the stock market, though prices have been a little better. At the north end of the Comstock the station at the 3300 level is finished, and the running of a west cross-cut is in order. The progress of this cross-cut will be watched with much interest, as it will be at a greater depth than any similar work in any place in the world.

At the Ophir and the Consolidated Virginia and California some interesting work will soon be done at points ranging from the 500 to the 1750 level.

The Hale and Norcross folks have opened up a large amount of ground on the 2800 level, that is ready for crosscutting. Soon there will be seen in the Chollar, Norcross, and all the middle mines, some lively work, beginning at the 3000 level and extending to the surface.

At Gold Hill all the leading mines are taking out a good deal of ore. It is not of very high grade, but still it pays a very fair profit for milling.

Bullion Shipments.

Bodie, Oct. 16, $1,576; Bonanza King, 11, $6,042: Christy, 14, $11,307; Contention, 17, $8,618; Navajo, 20, $14,000; Standard, 13, $13,722; Horn Silver, 14, $18,000; Ontario, 14, $11,580; Hanauer, 14, $5,750; Stormont, 14, $3,000; Wood River ore, 14, $1,700; Horn Silver, 15, $12,000; Ontario, 15, $4,978; Horn Silver, 16, $12,000; Ontario, 16, $4,640; Hanauer, 16, $5,800; Crescent, 16, $3,100; Wood River ore, 16, $6,000; Horn Silver, 17, $9,000; Ontario, 18, $4,834; Horn Silver, 18, $9,000; Christy, 18, $2,086; Hanauer, 18, $3,900; Crescent, 18, $2,100; Wood River ore, 18, $1,600; Hanauer, 18, $3,825; Crescent, 18, $3,900; Horn Silver, 19, $6,000; Christy, 19, $1,900; Hanauer, 19, $3,700; Queen of the Hills, 19, $1,600; Silver King, 18, $11,951; Bismark, 18, $5,892; Cuba, 18, $6,379.

The banks of Salt Lake City report the receipt for the week ending October 15th, inclusive, of $116,-792 79 bullion, and $10,800 ore; total $127,592 79.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

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S. F. VISITOR'S DIRECTORY.

For the convenient reference of our readers, and benefit of visitors to S. F. from the interior and abroad, we shall occasionally insert the following directory free. Officers of associations mentioned are invited to notify us promptly of any changes occurring from time to time.

California Academy of Sciences.

Hall and museum, S. W. corner California and Dupont. President, Prof. GEORGE DAVIDSON; Secretary, CHARLES G. YALE. Regular meetings, 1st and 3d Mondays of each month. Museum open to the public from 9 A. M. to 5 P. M. on Mondays, Wednesdays and Saturdays. Museum embraces all classes of natural history specimens.

Crocker Stanford Collection

This collection was presented to the California Academy of Sciences by Charles Crocker and Leland Stanford. It comprises a large number of specimens of minerals, casts and articles in all branches of natural history. Among other things are many of Ward's casts, including the monster elephants, mammals, etc. The collection is on exhibition at Mercantile Library Hall, 214 Bush St., and is open to the public every Saturday from 10 A. M. to 9 P. M. Chas. H. Gibbes, curator.

California Pharmaceutical Society.

Lectures are given at the hall of the College of Pharmacy Fulton street, between Polk and Van Ness avenue, three nights each week, for a term of six months, in the summer.

California State Geological Society.

Henry G. Hanks, President; S. Heydenfeldt, Jr., Secretary. Headquarters, State Mining Bureau, 212 Sutter St.

Geographical Society of the Pacific.

Rooms, 413 Sutter St. President, George Davidson; Secretary, C. Mitchell Grant. Meetings, 1st and 3d Tuesdays of each month

California State Mining Bureau.

Office and museum, 212 Sutter St. State Mineralogist, Henry G. Hanks. Open daily to visitors free, from 10 A. M. to 3 P. M. Museum comprises ores, minerals, rocks and natural products of the State.

Mechanics' Institute.

Rooms and library, 31 Post St. P. B. Cornwall, President; W. P. Stout, Recording Secretary; Horace Wilson, Librarian.

Peoples' Free Library.

Location, north side of Bush, between Kearny and Dupont. Librarian, Fred. B. Perkins. Open from 9 A. M. to 9 P. M.

Mercantile Library Association.

Library, 214 218 Bush. A. E. Whitaker, Librarian. There are 52,000 volumes in the library. Reading room, with papers and magazines.

Technical Society of the Pacific Coast.

Hall, 413 St. President, Col Geo H. Mendell, U. S. A.; Secretary, Charles G. Yale. Regular meeting, first Friday of each month; extra meeting for discussion of papers, last Friday of each month.

Society of California Pioneers.

Rooms, 308 Montgomery St. President, Nathaniel Holland; Secretary, F. Vassault. There is a library cabinet of minerals, relics of early times, and other objects of interest at the rooms. Regular meetings, first Monday of each month.

San Francisco Microscopical Society.

Rooms, 120 Sutter St. President, C. Mason Kinne; Secretary, E. J. Wickson. Meetings, second and fourth Wednesdays of each month.

University of California.

Location, Berkeley. Museum comprises the collection of the State Geographical Survey, the Pioche and Keene collections, and a large miscellaneous collection of the woods, ores, minerals, rocks, etc., of the Pacific Coast.

Golden Gate Park.

The Park may be reached directly by cable cars of the Haight St. or McAllister St. line, which run out Market and branch off at the streets named, for the Park, or by the Geary St. line. The Park is opened for visitors at all times.

Woodward's Gardens.

Mission St., between 13th and 14th. Reached by Folsom, Mission, Howard and Market St. cars. In the gardens are menagerie, museum, art gallery, aviary, aquarium, theatre, estaurant, etc.

PHYSIOLOGICAL OPTICS.—A science of a very recent date, in the doctrine of the anomalies of refraction and accommodation, the connection between science and practice is more closely drawn together than in any part of medicine. Many an obscure type of disease emerged into the clearest light, and assumed, as if spontaneously, an elegant simplicity. Prof. Donders, page 329, remarks how necessary a want of knowledge it is to the correct diagnosis of the various defects of the eye, and how deeply it affects the whole treatment of the oculist, wille come to the sad conviction that an incredible number of patients have been tormented with all sorts of remedies, and have been mutilated by inappropriate operations, who would have found immediate relief and deliverance in suitable "spectacles." C. Muller, the Optician, 135 Montgomery street, advises parents having children complaining of their eyes, subject to inflammation, headache, deviating in or out, as the case may be, to call. He will explain the cause and remedy of all such difficulties, very often the means of saving the loss of sight of the deviating eye, sure to follow physical exclusion. All complicated cases of defective vision thoroughly diagnosed free of charge. Every possible combination of lenses mounted in two hours notice. Correcting all errors of refraction and accommodation in simple or compound astigmatism, belonging to Myopia or Hypermetropia and Presbyopia, the result of advancing years, X

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"ASSAYING GOLD AND SILVER ORES"—By C. H. Aaron—Is a new work published by Dewey & Co., which is intended by its author to be available for the use of miners, prospectors and others who only care to know how to assay gold and silver ores.

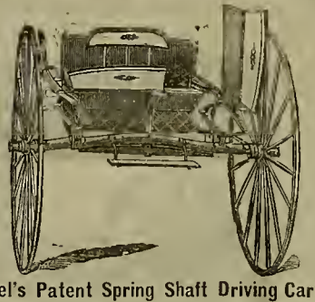
The author of this work is well known in the mining regions of the Pacific coast as a practical metallurgist of many years experience. His writings for the press and his two previous works ("Testing and Working Silver Ores," and "Leaching Gold and Silver Ores") have shown his ability as a writer. The little book is plainly and simply written, more especially for the use of those persons not familiar with chemistry. No symbols are used, everything being plainly stated and clearly described. The scope of the book is shown in its table of contents as follows: Introduction; Implements; Assay Balance; Materials; The Assay Office; Preparation of the Ore; Weighing the Charge; Mixing and Charging; Assay Litharge; Systems of the Crucible Assay; Preliminary Assay; Dressing the Crucible Assays; Examples of Dressing; The Melting in Crucibles; Scorification; Cupellation; Weighing the Bead; Parting; Calculating the Assay; Assay of Ore Containing Coarse Metal; Assay of Roasted Ore for Solubility; To Assay a Cupel; Assay by Amalgamation; To Find the Value of a Specimen; Tests for Ores; A Few Special Minerals; Solubility of Metals; Substitutes and Expedients; Assay Tables. These assaying tables give simple directions for figuring out results. This is the simplest, cheapest and most easily comprehended work on assaying yet published. The volume comprises 106 pages, with illustrations, and is well bound in cloth. The price is $1, postpaid. Published by Dewey & Co., MINING AND SCIENTIFIC PRESS office, San Francisco—1884.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First street, a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below costs, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. References as to above can be had upon applying to this office.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.



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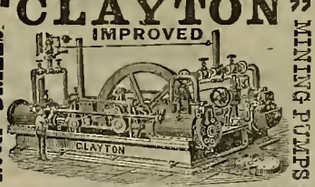

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ASSESSMENT NOTICE.

The Lamphire Gold Mine and Milling Company—Location of principal place of business, San Francisco, Cal.; location of works, Tuolumne Mining District, Tuolumne County, Cal.

NOTICE is hereby given that at a meeting of the Board of Directors, held on Friday, the third (3d) day of October, 1884, an assessment (No. 1) of ten (10) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the President, David McClure, at the office of the company, room No. 2, No. 526 Montgomery street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on Monday, the seventeenth (17th) day of November, 1884, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the eighth (8th) day of December, 1884, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

ADDISON MARTIN, Sec'y.

OFFICE—Room No. 2, No. 526 Montgomery Street, San Francisco, California.

STOCKHOLDERS' MEETING.

Notice is hereby given that a meeting of the Stockholders of Fremont Mining and Milling Company will be held at the Company's office, No. 402 Front Street, Room 8, San Francisco, California, on Tuesday, November 11th, 1884, at 12 o'clock M., for the purpose of electing officers for the Company, and of acting upon a proposed amendment of the By-Laws of the Company, providing that vacancies in the offices of President, Vice-President, and Trustees, shall be filled by the Board of Trustees.

MARK T. ASHBY, Secretary.

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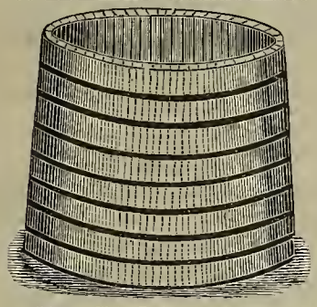
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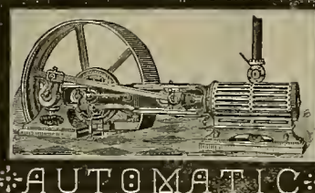
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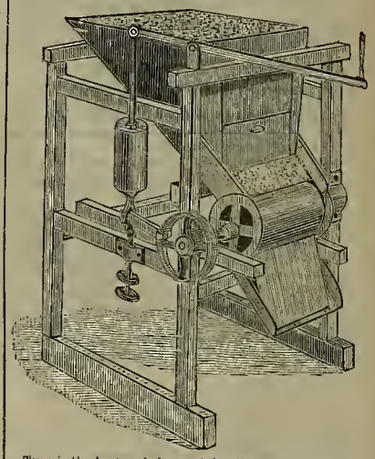
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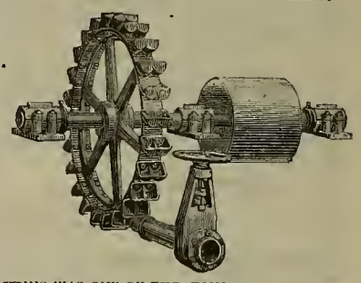
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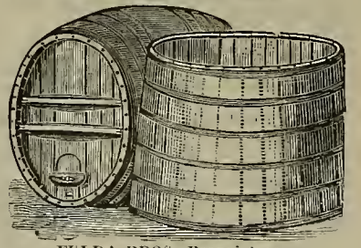
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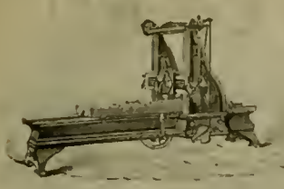
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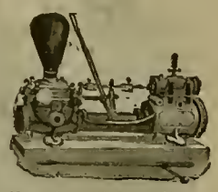
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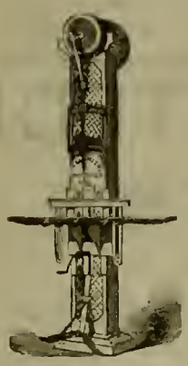

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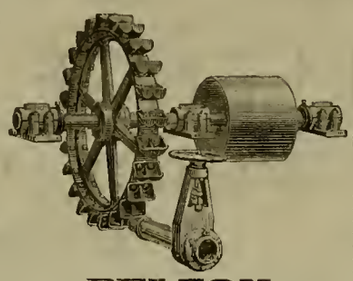
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WIRE ROPE, Flat and Round, of the best material and workmanship. Large Stock always on hand. Special sizes made to order.

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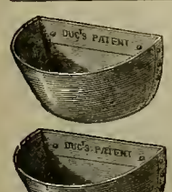

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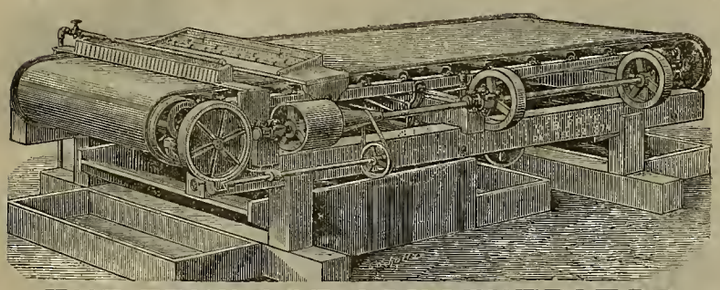


THE FRUE ORE CONCENTRATOR,
OR VANNING MACHINE.

PRICE: FIVE HUNDRED AND SEVENTY-FIVE DOLLARS, ($575 00), F. O. B.

OVER 1,000 ARE NOW IN USE. Saves from 40 to 100 per cent more than any other Concentrator. Concentrations are clean from the first working. The wear and tear are merely nominal. A machine can be seen in working order and ready to make tests at the Fulton Iron Works, No. 220 Fremont Street, San Francisco.

As the result of a suit East against an End-Shake Machine (the Embrey), similar to the Triumph, the Frue Vanning Machine Company owns the Embrey patent, and can put in the market an End-Shake Machine of earlier patent that will do as good work as the Triumph, and superior in construction and durability. There will be no risk of suit for infringement.

The Frue Vanning Machine Company warn the public that they claim and will prove the Triumph machine to be an infringement on patents owned by them.

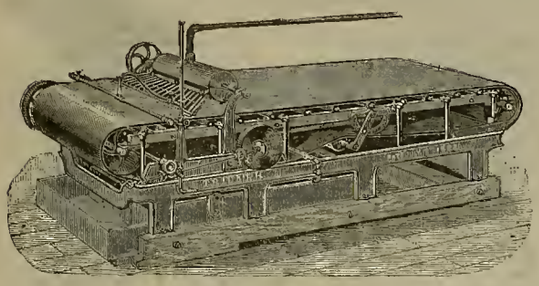
Protected by patents May 4, 1869, Dec. 22, 1874, Sept. 2, 1879, April 27, 1880, March 22, 1881, Feb. 20, 1883, Sept. 18, 1883. Patents applied for.

N. B.—We are and have been ready at any time to make a competitive trial against the Triumph, or any other Concentrator for stakes of $1,000.

ADAMS & CARTER, Agents Frue Vanning Machine Co.,

Room 7—No. 109 California Street, - - - SAN FRANCISCO, CAL.

$1,000 CHALLENGE ACCEPTED!



THE
"TRIUMPH" ORE CONCENTRATOR.

PRICE, FIVE HUNDRED AND FIFTY DOLLARS ($550.00), F. O. B.

THE "TRIUMPH" TRIUMPHANT!

In a competitive trial recently had between two of the **"Triumph" Ore Concentrators** and the same number of **"Frue' Vanning Machines,** at the mill of the celebrated gold producing Original Empire Mill and Mining Company, in Grass Valley, Nevada County, Cal., the "Triumphs" produced thirteen and fifteen one-hundredths (13.15) per cent more concentrations than did the "Frue" Vanners, during a run of twenty-four consecutive days, or a net gold coin result of $193.15, or $8.30 per day, in favor of the two "Triumph" Concentrators.

These returns do not include the value of the amalgam saved by the "Triumphs" during the test; which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarily saved, which is lost on the "Frue" Vanners.

This trial was conducted under the personal supervision of the Manager and Superintendent of that Company, in a strictly fair and impartial manner, and with the sole view of determining, in the interest of that Company, the merits and demerits of the respective machines by a thoroughly practical test. A relation of the course of procedure, a concise analysis of assays, and a tabulated statement of the net bullion results, with accurate deductions therefrom, will soon be published in Circular form.

The superiority of the present construction of the "Triumph" over the form originally introduced, together with the demonstrated results of the above, and other trials had with the "Frue" Vanners, induce us to and **we hereby accept the Challenge of $1,000,** flaunted by the Agents of the "Frue Vanning Machine Company," and hold ourselves in readiness to enter into a second competitive trial for that sum, at such place and upon such terms and conditions as may hereafter be mutually arranged.

We guarantee purchasers against all costs, expenses or charges incurred by reason of any infringements of any existing patents.

"Put up or shut up," and "Let the Best Machine win!"

JOSHUA HENDY MACHINE WORKS,
Nos. 39 to 51 Fremont St., San Francisco, Cal.

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Boilers, Engines and Machinery of Every Description.

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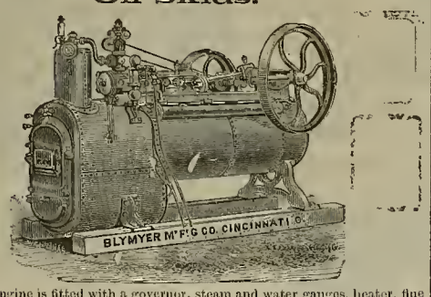
On Skids.



Each engine is fitted with a governor, steam and water gauges, heater, flue brush, waste and blow-off cocks, brass whistle, smoke stack with spark arrester, oil cups, gauge cocks, combination check and stop valve, and pump.

Both boiler and engine are fitted in complete running order, and are sold either mounted on strong wheels with wide tires, or on skids.

STEAM PUMPS
OF ALL MAKES.

Mining Pumps.

Quartz and Sawmill Machinery.

AGENTS FOR THE SALE OF

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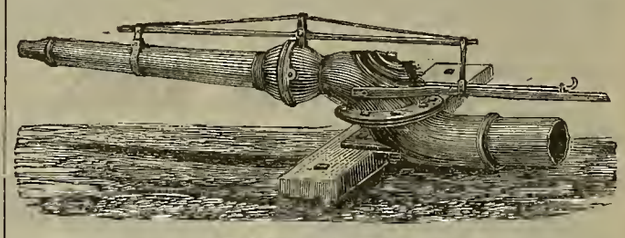
IMPROVED FORM OF
HYDRAULIC GIANTS.



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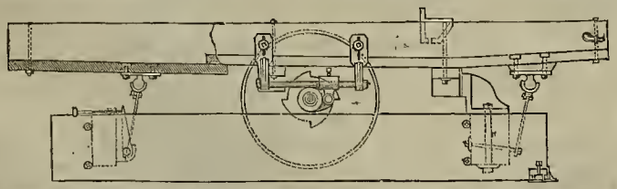
Hydraulic Mining Machinery of every Description.

PATTEN'S
CONCENTRATOR AND AMALGAMATOR COMBINED.



This machine requires less power, less care or attention, and is less liable to get out of repair than any Concentrator now in use. All of which any practical miner will comprehend when seeing it in operation.

The wear and tear is nominal, and the construction so simple that any miner can put it up and run it; and the low price brings it within the reach of all millmen, as it will save enough to pay for itself in any mill in a very short time. One machine will concentrate the tailings from a five-stamp battery.

The undersigned is now located at the Ætna Iron Works, 217 to 221 Fremont street, where he is building the above machines and prepared to fill orders, and guarantee them to do all that is claimed. Weight 625 pounds; price, $300. **Estimates given and orders promptly filled for all kinds of Mining Machinery.**

☞ Assays and practical working tests made of ores,

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Entirely Exempt from Hemp or Jute. Softest and Most Pliable Packing Made. Does not lose its Strength when worn by the rod, and does not Scatter or dissolve by power of Steam or Water.

Sufficient for a Trial will be Furnished Free of Charge.

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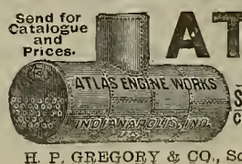

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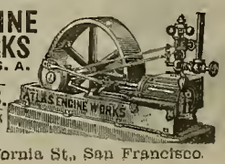
INDIANAPOLIS, IND., U. S. A.
MANUFACTURERS OF
STEAM ENGINES & BOILERS.
Carry Engines and Boilers in Stock for immediate delivery.



H. P. GREGORY & CO., Sole Agents, 2 and 4 California St., San Francisco.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, NOVEMBER 1, 1884. VOLUME XLIX Number 18.

The Westinghouse Automatic Engine.

The engravings on this page represent front and rear views of a 160 horse-power Westinghouse automatic engine, a type which is now being very rapidly introduced for furnishing power for all sorts of purposes. There are several on this coast and in this city. The Pacific Rolling Mills use one for running the saws for sawing off hot bars. Mr. Denniston has one at the San Francisco Plating Works, and George M. Tay runs his shop with one. There is one at Bellevue, Idaho; Seattle, W. T.; New Tacoma, W. T. (on Carson saw mill); four at Astoria, one at Portland, and at other places on the coast. The manufacturers publish a list of their monthly sales, which have steadily increased from two engines of 23 horse-power in July, 1881 to 57 engines of 1,632 horse-power in the month of May, 1884. Some of the latter are the sixth or seventh order from the same men. This furnishes a pretty sure test of the utility and excellence of the engine.

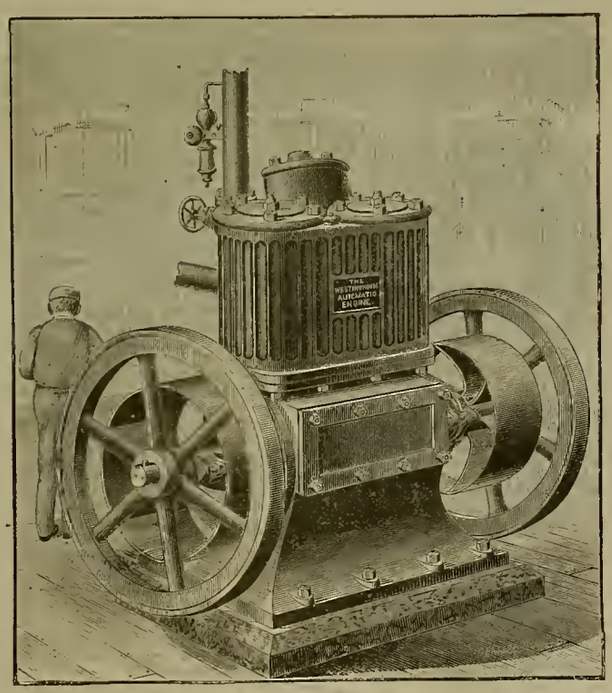


FIG. 1.—FRONT VIEW OF 160 H. P. WESTINGHOUSE ENGINE.

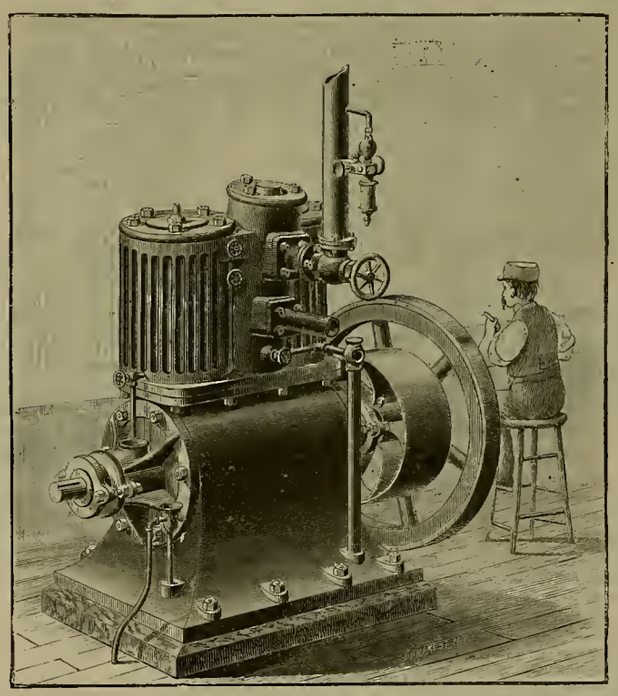


FIG. 2. REAR VIEW OF 160 H. P. WESTINGHOUSE ENGINE.

As will be seen by the accompanying engravings, the working parts are entirely enclosed, and really run in a basin or receptacle of lubricants, which is continually splashing over the working parts. The objective points in designing the Westinghouse engine were: First, to render the engine, by its extreme simplicity and the peculiarity of its design, as to adjustments, keeping up, packing, oiling, etc., independent of the attendance of an unskilled engineer. Second, to reduce the requirements of repair to a minimum by making the good performance of the engine independent of wear. Third, to make the repairs, when required, at the lowest possible expense by renewing (not patching up) removable and inexpensive wearing parts only, by duplication to gauge, thus maintaining the machine in all essential respects new, even after long use. Fourth, to secure high speed, so absolutely essential in many cases, such as electric lighting, blowing, etc. Fifth, to retain with these advantages a proper grade of fuel economy. Sixth, to place a strictly first-class automatic engine on the market at a moderate price, with both large and small engines.

The usual duties of an engineer in charge of a common horizontal or vertical double-acting engine are: To start and stop; to fill the cylinder lubricator; to keep oil-cups full; to oil all running bearings frequently; to keep the pedestal and various brasses keyed up between the alternatives of heating and pounding; to pack joints and stuffing-boxes; frequent adjustment of the valve motion; occasional lining up all over; making minor repairs, etc.

In these engines, however, there are no oil cups: the running bearings lubricate themselves continuously; there are no "brasses" about the engine that can be keyed up, or a necessity for it if there were; there is not a packed joint or a stuffing-box on the engine; the valve adjustments are made final and permanent before the engine leaves the shop; the engine is self-contained and independent of alignment; short of absolute breakage there are no minor repairs; the parts being enclosed and the main bearings being protected from drip, there is little or nothing to wipe; and, since every nut is set up solid and kept so, there is no room for carelessness with the wrench. It is a distinctive feature of the design that the wearing parts are removable and not adjustable, and hence it approximates the literal truth that the duties of an engineer are confined to the first two counts. The value of this fact in locations where skilled help is unavailable, is apparent. Of course none of the nuts on connecting rods or eccentric straps should be allowed to work loose. A liner may also be removed from the rods and strap when the wear becomes considerable. There are also many mills using a large number of engines scattered about the works. In such a case, no separate engineers are required, but one man makes the rounds and attends to any reasonable number of engines.

The engine is single acting. The steam ports and exhaust openings are large, and reciprocating parts equally balanced. The system of lubrication is such that there is no chance of any failure. The engines are all tested in the shop before being sent out. They are adapted for electric lighting, saw mills, rolling mills, grain elevators, wire mills, flour and paper mills, mining, light manufacturing, etc. A reversing marine engine of the same type is made. The engines are made from four to 200 horse-power. Messrs. Parke & Lacy have recently obtained the agency of these engines for this coast, and are now putting one up in their place at 21 Fremont street, where it will be set at work so any one can see it running. The mechanism of the engine is very interesting, and in a future number of the PRESS we shall give further details. Some 900 of these engines are now at work in the United States.

THE receipts of the Postoffice Department for the fiscal year ending June 30, 1884, exclusive of the money-order revenue, was $42,818,635, and the expenditures $46,411,772, leaving a deficiency of $3,593,137, which is attributed to the reduced postal rates. The deficiency will be reduced about $400,000 by money-order revenues.

THE Paris *Patrie* hears that it is probable, in the event of the failure of the present active overtures of England in the direction of mediation between France and China, that re-enforcements of 20,000 troops will be sent to China, with a view of occupying Canton.

SAN Joaquin county registers 8,612 names.

Gold.

The gold-producing countries of the world are few, and our own State has for many years been the largest. California, at one bound, took the first place as a producer of gold and has indisputedly held its position, since the metal was first discovered within its boundaries. Its production has gradually decreased for some years, owing to easily understood causes; the exhaustion of placer fields, beds, bars, etc., and the working out of many deposits. The past year, however, the yield of gold has been much restricted for other reasons. Litigation has prevented the working of known deposits, many of our large gravel mines having been closed down by injunctions from the courts. The report of the Director of the United States Mint for the fiscal year ending June 30th, has just been issued, in which he states that the coinage of gold was $8,000,000 less than in the previous year. The deposits of gold during the year were $46,326,679, of which over $29,000,000 was of domestic production. Silver purchased for coinage and deposited for bars, amounted, at coining value, to $36,520,290, of which over $31,000,000 was of domestic production. The total value of gold and silver deposited and purchased, including redeposits, was $87,955,155—about the same as in previous years. The coinage amounted to $57,880,921, of which $27,932,824 was gold, $28,778,389 silver dollars and $1,174,709 minor coins. Besides the manufacture of coin, gold bars of the value of $23,875,586 and silver bars of the value of $7,639,724, making a total of $31,515,310, were prepared at mints and assay offices. The number of silver dollars distributed during the year was over 17,000,000. The total estimated in active circulation, October 1884, are over $40,000,000, an increase of $5,000,000.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS

Deer Lodge, Montana.

EDITORS PRESS:—Deer Lodge is the county-seat of Deer Lodge county, Montana, in the southwestern portion of the Territory. It lies in the midst of Deer Lodge valley, which is an agricultural region of considerable extent. Although not very wide at this point, the valley above and below has an average width of at least 10 miles for 30 to 40 miles of its length. Most of this extent of country contains excellent farming land, and is settled up by farmers who are fast becoming well-to-do, if they are not already so. The soil and climate seem well adapted to small grain, and the reported yield in certain localities, especially of oats, is something almost fabulous, running as high, in favored spots, as 90 to 100 bushels per acre. The farming season is short, but of sufficient length for wheat, oats and barley. The barley crop here is said to be good and strong. This year a snow storm has caught some of the farmers before harvest was over, but this, we understand, is unusual. The trade at the town of Deer Lodge is mostly from farmers. The population of the town is probably some 700 or 800. It includes many very pretty homes, with shrubbery and trees growing about. It is a quiet, rural town, and is counted one of the handsomest villages in the Territory. It is well supplied with educational facilities, having a large public school building, a Presbyterian Territorial college—the College of Montana—and a Catholic college. It has also a large and well-managed local paper, the *New Northwest*, the office of which is fitted up with steam press and all necessary appliances. But although an agricultural town in the main, it has mining prospects and some working placer mines in the mountains back of it. Pilgrim Bar, now Yamhill, was one of the early placer diggings of the Territory, and still yields good returns. It is about 13 miles from town. There are also said to be splendid prospects for a big quartz mine, some 12 miles southeast of town, where a fine ledge of ore, similar to that which prevails at Butte, has been uncovered. Work in a quiet way is going on there. The parties interested think that the application of a little capital would yield large results. There is also the Pioneer claim, 16 miles from town, that is well spoken of.

Amongst the enterprising firms here, that of Bennett Brothers, dealers in agricultural implements, wagons, carriages, harness, produce, etc., is probably the most extensive. They have branches in Butte City, Missoula and Townsend, besides the parent house at Deer Lodge, and they ship goods all over the Territory.

Albert Kleinschmidt & Co., with Addison Smith, manager, at Deer Lodge, do a large business in general merchandise. Mr. Smith is an old newspaper man, but seems to take naturally to his present occupation.

The Deer Lodge Drug Co. have a large, fine drug store, and besides being dealers in pure drugs, also keep for sale stationery, etc.

P.

The Denver Exposition.

The exposition for 1884 is over, and has become one of the events of the past. As an exhibition of the resources of Colorado and the adjoining Territories, the management can congratulate themselves upon making a fair success. The displays were generally good—better than last year, though in many points inferior to those of two years ago. In all other respects the exposition was a decided failure. The attendance was small, and consisted almost entirely of people from Denver or points in the State, but very few Eastern people being numbered among the visitors; the losses were heavy, aggregating $25,000; and the general tendency was to discourage those who have thus far made exhibits. It is not probable that Denver will have another exposition for many years to come. When the people of Denver become public-spirited enough to patronize liberally such an enterprise; when the towns of our State become interested in what will bring them the greatest possible benefit; when the Territories make an effort in our behalf such as they are now engaged in making for the New Orleans exhibition; when the railroads are willing to adopt a liberal policy towards us, and at the same time benefit themselves to a large extent, then, and not until then, will it be possible to hold a successful mining and industrial exposition at Denver. We regret the failure, because it will affect this whole section disastrously, but it is just what we expected and predicted when it was found impossible to make fair arrangements with the railroads leading to the East.—*Rocky Mountain Mining Review.*

NICKEL.—Parties in this city assert that they have made a big find of nickel at a place within 25 miles of the Comstock. Just where their find is located they do not care to say at present. The vein, they say, has heretofore been looked upon as being merely a big mass of iron and other base metals.—*Virginia Enterprise.*

San Francisco Bay.

Can the Shoaling of the Harbor be Prevented?

Last July the Chamber of Commerce, of this city, considered the subject of the shoaling of the harbor, and took some steps toward investigation of the matter. The Chamber of Commerce addressed a letter to Prof. George Davidson, of the U. S. Coast and Geodetic Survey, (as President of the Geographical Society of the Pacific) asking him certain questions, and among others the following: "Are you satisfied that, by reason of the decrease of the tidal prism resulting from the deposits coming down the Sacramento river and its affluents; from the filling in of the bay constantly going on, both with and without authority of law; and from the depositing in the navigable channels of the bay of material dredged from the city front, the bar of San Francisco may not be shoaled and widened, thus irretrievably injuring this maritime port as apprehended by this chamber?"

In this letter Professor Davidson has replied as follows:

The subject you propose to me for solution or consideration is an important one to all the varied industries of this city and State, and has a reach beyond what appears patent at this day.

The conditions of the bar and the harbor of San Francisco, and their dependence, in great measure, upon the character of the bay and the rivers and streams emptying into it, may well excite the jealous care of the Chamber of Commerce and the Board of Trade. But beyond this the State of California and the Government of the United States, should exercise knowledge, vigilance and authority in preserving their integrity.

In so far as I have been able, I have at every legitimate opportunity endeavored to show the dangers to be apprehended to our navigation by decreasing the volume of the tidal waters entering and leaving the Golden Gate. I have been on record for over 30 years in this matter, and you may therefore feel assured that I shall ever be ready to assist your honorable body and the constituted authorities in maintaining the present high character of the entrance to this harbor.

It is evident that your letter was prompted by the report upon the alleged shoaling of the bar of San Francisco Bay by a special committee of the Geographical Society of the Pacific, and my paper thereon.

The Main Questions.

The main questions then brought before the committee and the society were:

1. Whether the depth of water upon the bar had decreased.

2. Whether the asserted shoaling of large areas inside the bar had taken place.

3. Whether the south channel across the bar has been so filled up as to be dangerous to the navigation of large vessels.

You will perceive that the causes for such reported changes were not the subject of discussion upon that occasion. This was not unintentional, but the propositions presented were sharply drawn.

In my treatment of the subject I showed, beyond cavil, that, so far as the successive surveys could guide us, there had been no shoaling on the bar, that there had been no shoaling over large areas, and that the south channel preserved its character.

I also endeavored to impress upon the society how difficult it was to make minute surveys under the disadvantageous conditions that environ the bar and approaches, and I expressed my conviction, from the evidence presented, that no sensible changes for the worse had taken place up to 1873. This view is corroborated by the tentative examination made since my paper was read, wherein 16 lines of sounding across the bar, and 2 along its crest, fail to reveal any damage to the bar and its approaches, on the inside or on the outside.

The questions which you propounded at the close of your letter are of grave and vital interest in a consideration of the causes which will finally affect the depth of water upon the bar of San Francisco. And on this matter I have never had any halting or doubtful opinion.

In reply to similar verbal questions addressed to me when I read the paper before the Geographical Society, I asserted that there will inevitably be shoaling upon the bar, and that many causes are conspiring to this result, of which some are within our control.

It may be taken as a law that whenever the

Volume of the Tidal Waters

Of the bay is decreased, or the freedom of the movement of this volume is impaired, the amount of scouring effect on the bar will be decreased. This volume I have elsewhere denominated the tidal prism, and the term may be used for brevity. This large outgoing prism, aided by the volume of waters from all the rivers and streams emptying into the bay, and these, moved by the "large" and long ebb tides, peculiar to this coast, give us the great depth of water upon the bar.

The bar itself is not a simple result of these out-rushing waters meeting the comparatively quiet waters of the ocean. I have long since demonstrated that a close inshore eddy current, works along our whole seaboard to the northward, and that it moves fine material along the shoaler waters of the shores in that direction. It is this prevailing and persistent action, no matter how small at times, which gives to most of the entrances to the harbors, bays and rivers, the long sandspit stretching from the southern shore, and which forces the channels to break through the bars directly in face of the strong northwest swell and northwest winds. The bar of San Francisco is one of the strongest proofs we have of this movement of material to the northward by this inshore eddy current, notwithstanding the complication of the tidal current therewith.

The Bar of San Francisco

Is formed mainly under the action of this eddy current bringing its material from the southward, and an examination of the material of the bar substantiates this deduction. So far as examinations have been made of hundreds of specimens, the material brought from the bottom has been marine, and not fluvial. This is also confirmed by the existence of living *echinus* and other shells on different parts of the bar, a fact first brought to light in the examination of 1873, corroborated in 1874, and again verified within the last two months.

I am satisfied that exhaustive examinations of the material of the bar and its approaches on either side, will indicate decrease of depth from deposits of river material, long before the lead or any similar crude means of measurement will do so.

But even before the deposit of river material begins, the finer seashore sand, which is in continual movement, will be deposited in the quieter places when the volume of the outgoing waters is decreased, but it will be practically difficult to say when this commences.

Even if there were no human causes at work, the

Natural Denudation of the Surface

Of the areas drained by the great rivers and by every trifling stream, supplies material that will, in the course of time, fill up the upper bays and decrease the tidal prism of the whole bay. When that tidal prism begins to decrease, then the bar will begin to be affected adversely. It must be that the first accretion is only one grain of sand, nevertheless it is a change, although wholly beyond our practical means of detection. Even if we detect the change, the rate of accretion we may never know. These, and other natural causes, might require thousands of years to work any effective harm in a commercial sense.

But to these causes are added others controlled by the operations of man, such as the material carried from the tilled lands of a great agricultural region; from lands whose surface is trodden and broken by the hoofs of herds and flocks; from the opening of roads, etc.; from denuting the sloping hillsides of timber and brush, and thus exposing the surface of the soil to the eroding action of the rains, winds, frosts, etc. From the amount of material brought down the rivers from milling operations, from the building of wharfs, causeways, training piers or jetties, etc.. will not only decrease the tidal prism, but are frictional agents against the free movement of the water; from the reclamation of marsh and overflow lands, thereby cutting off sloughs and preventing "large" high tides covering broad areas; from the deposit of any material, such as the refuse of cities and towns, dredging material, etc., in the waters of the bay.

Deposits of Material

From all these and from other sources either diminish the tidal prism directly, or they shoal the weaker and quieter parts of the bay and thus retard the free movement of the waters. And the area of the shoal parts of the bay is so great, and the movement of the tidal waters so slow thereon, that any increase of deposit must immediately produce a damaging effect, however, infinitesimal it may be.

Structures may be so located as to prevent the currents moving in their usual course; and by embaying part of them the material in suspension is thrown down in localities where the quicter waters solicit it, and which would otherwise have been carried to sea.

From the many variable factors involved in this act of deposition of material, it is impossible to obtain a mathematical expression that shall give us the rate and amount of change. We are therefore compelled to resort to practical tests, and these should be comprehensive and far reaching. The means for obtaining such examinations are within your grasp, and I have no doubt but that, when the demand of commerce, of manufactures, of agriculture, of mining, of the thousand dependent industries of the Pacific States are presented in a manner commensurate with the gravity of the situation, to the general government and to the State, a broad and liberal policy will be exhibited.

Other large maritime cities have long since risen to the necessity of preserving their great water communications for the commerce of the world, and have met with a generous spirit.

Detrimental Acts.

At the best our citizens have been lukewarm or partisan, and you must reflect that a crude and a selfish policy, destructive to the integrity of the bar and harbor of San Francisco has been persistently pursued by the people, by the State and by the general government. It would be invidious to specify acts and works of the plainest and most detrimental character, that are obvious to all who have kept in mind the physical history of these waters and their relation to future commerce.

With these conflicting drawbacks I do not wonder that no combined and consistent efforts have been made to meet the exigencies which attach to the living questions at issue. These questions involve more than appears upon the surface. They demand the gravest deliberation of the statesman, the judge, the representatives of the large industries and the skill and integrity of the engineer. The matter has never been absent from my reflection and study, and notwithstanding its difficulties I am sure that some feasible plan, for the initiation at least, is practicable.

I am glad to know that the Chamber of Commerce proposes to move earnestly in this question, and as I said at the beginning of this letter, I shall ever be ready and willing to join in your efforts. During my late visit to Washington I personally urged upon the Superintendent of the Coast and Geodetic Survey, the necessity for systematic resurveys of the bar of San Francisco and its approaches, and he assured me that he would direct such a survey to be made during this fiscal year if the condition of the scanty appropriation would permit it.

Depression in Tin.

Tin in all its various forms has had a drooping tendency for several months. This remark is not restricted to the local market. There have been exceptional causes for the weakness here, such as over-supply and restricted demand. The quantity required by the canners of the coast was over-estimated. It is between seasons in the demand from that source at present. Recently the English market has exhibited a downward tendency. China is a large consumer, and there is a prospect that the war may interfere with the demand from that country. The principal sources of block tin are the Straits and Australia. The shipments from Singapore and Penang from January 1st to to September 30th compare at follows:

	1883.	1883.
To America, tons	5,775	2,810
To England	5,810	9,175
Total	11,585	11,985

The result shows a decrease of 2,965 tons to America, but an increase of 3,365 tons to England. The stock in first and second hands in New York, October 1st, was estimated by Charles Nordhaus at 1,400 tons, to which add 800 tons afloat from the Straits, 150 tons from Europe and 50 from Australia, and the visible American supply October 1st was 2,400 tons, against 3,725 tons in 1883, and 3,050 tons in 1882.—*Bulletin.*

WASTE IN MILLING.—It seems strange that improvements are not devised, by which the waste in tailings can be prevented. This waste oftentimes is greater than the savings, and always enough to be richly remunerative. That such wasteful methods should still be employed indicates the lucrative field now open to inventive genius. The following extract from the Leadville *Herald* will illustrate the losses which occur and the savings by reworking. "Mr. John T. Herrick, formerly Manager of the London Mining Company, and at present operating the London mill, is in the city. Mr. Herrick is running the tailings in the ponds through the mill a second time, and is doing very well. They are fed into the batteries again the same as ore, and passed under the stamps, the drop of which has been reduced three inches. The tailings all assay from $8 to $15 per ton, and having been subject to repeated freezing and thawing during the past 12 months, are more decomposed and oxidized than when first milled, and yield a greater amount of free-milling gold. Moreover, improvements have been made which insure closer and more economical work. Mr. Herrick also stated that the amalgam secured from the tailings is nearly sufficient to pay the running expenses of the mill."

ARIZONA MINING.—Mining continues to be one of our chief industries. The summer just passed has not been noted for a very large output of the precious metals, nor for any very rich strikes, and yet the United Verde Company, the Dosoris Company, the Black Warrior, Pine Spring and several smaller companies, have taken out and shipped a great deal of bullion and ore. Miners say the great need of this section is a plant for the reduction of all classes of rich ore. Prescott, being centrally located, is the proper place to put up and operate an institution of this kind, for the want of which mining is greatly retarded in these mountains. There are at present in mountains around Prescott more than 1,000 people who live off the mines, which are everywhere found cropping out of the ground. Instead of 1,000, there should be 10,000 people working mines. There will be more than this number soon after the completion of the first north and south railroad—an event we confidently expect to occur the coming year.—*Prescott Courier.*

PRODUCTION OF THE COMSTOCK.—About 600 tons of "low grade ore" is the average daily production from the mines on the Comstock and elsewhere in Storey county, Nev. Of this, about 500 tons are daily shipped by the V. & T. Railroad to the mills on the Carson river. The Union Mill & Mining Company do nearly all the crushing, and charge $9 per ton, giving a gross income of about $4,500 per day to the mill-owners. The cost of reduction is estimated to be in the neighborhood of $5 per ton, leaving a net profit of say $2,500 per day.

MECHANICAL PROGRESS.

Wood vs. Iron.

This seems to be the only country in which wood working and wood-working machinery are gaining ground. In addition to the enormous amount of articles under the head of "woodenware" which are consumed in this country, the value of such goods exported in 1882 reached the enormous sum of $500,000,000, the article of furniture alone amounting to nearly $76,000,000. The following from a German correspondent of the *Railroad Gazette* will answer quite as well for France or England as for the "Fatherland:"

"Wood-working machinery in German shops is comparatively small in amount, owing to the great and yearly increasing use of iron in all parts. This is due to increasing cheapness of iron as compared with wood, and of wrought iron as compared with cast in proportion to its security. The use of wrought iron instead of cast is very extended. I saw narrow-gauge stock building at Chemnitz and Leipsic with iron frames throughout, which had absolutely no cast iron in any part except the journal boxes. The increased use of iron is regretted by some master mechanics, on account of the greater rigidity and of the consequently greater violence of shocks in train service. A surfacer, band saw, cut-off saw, or driving planer and boring machine, are the tools ordinarily found in German wood-shops. Suctions for carrying shavings to the boiler room are now used in the shops I have seen. The shavings are used, however, very extensively for firing, in combination with about nine times their weight of coal slack. This coal slack costs 84½ cents per ton delivered at the railroad. It is fired automatically with a hopper and a screw which pushes the fuel in under the fire. It is also fired by being run from a hopper above the fire-door over a grate inclined forward, from which it drops into the fire. The latter is raked partly back under the inclined grate, so that the fuel is well heated before joining the fire, and its smoke products pass over the front portion of the fire on their way to the flues and are very effectually consumed. This firing method is common, I believe, to several styles of Fire-box, but I do not remember to have heard before of its application to this kind of fuel, to which it is well adapted. By the use of this fuel and firing, the boilers of the Chemnitz shops of the Saxon State Railway evaporate 100 pounds of water at an expense of 1.11 cents.

A Theory of Lubrication.

Walter R. Brown, an English investigator of some note, writes to the *Engineer* as follows:

Certain theoretical conclusions as to the nature of friction in the case of lubricated surfaces may perhaps be deduced. We may assume that the surface of the journal and bearing are divided from each other by a film of oil sufficiently thick to prevent their coming in contact; that this film is divided into two rings, one adhering to the moving journal, the other to the stationary bearing; and that the resistances, here called by the name of friction, are really those which occur at the bounding surface where these two rings meet each other. This is, in fact, a conclusion to which engineers have generally come, from practical experience, and it is confirmed by a curious fact which occurred in the course of Mr. Tower's experiments. It was found that when a small hole was drilled down from above, through the brass bearing on which the load rested, the oil rose in this hole, and could not be kept from doing so except by the application of a very great pressure—more than 200 pounds per square inch in that particular case. This proves the existence at the point of greatest pressure between journal and bearing of a film of oil capable of sustaining that pressure, and of being slowly squeezed out by it where an opening presented itself. It is clear that this film cannot be wholly at rest, but must be recruited from the oil bath below, through the action of the rotating journal; otherwise the film would almost immediately have been squeezed out, and thus the whole of the journal would have become dry and would have seized.

We are therefore justified in assuming that there is, in the case of a completely lubricated journal, such as we are considering, a film of oil adhering to the outside of the journal, and another film adhering to the inside of the bearing. These two films are constantly sliding or shearing one past the other at the surface speed, whatever that may be, of the journal.

PROGRESS IN LOCOMOTIVE BUILDING.—The locomotive of to-day is a giant by the side of the production of 1851. The New York Central express engine is a very Anak. Its weight is 84,000 pounds, or nearly two and a half times heavier than its above-mentioned prototype. The cylinders are 18 inches by 24. The average man's head is far below the top of the driving wheels, which are 75 inches in diameter. In 1854 a New York express passenger locomotive traveled 25,000 miles in a year; last year the average mileage per engine stood between 70,000 and 80,000 miles. A locomotive for express passenger service costs, taking the experience of the past few years, from $3,500 to $10,000 to build. In comparing the locomotives of to-day and a quarter of a century ago, you will notice that while the weight of the whole machine has increased greatly, certain of the dimensions have not altered much. This is because we are limited in various ways in constructing a locomotive. We cannot make the body of the engine over a certain width, because of the gauge of the track; not over a certain hight, because we must keep the center of gravity at about the same position; not over a certain length, because of the wheel centers. So the locomotive must always remain nearly the same in form. It is to increased capacity of boilers that we must look for increase of power. At present an express locomotive boiler is of 80-horse power, that is, if it were a stationary engine that would be its capacity. But when the locomotive is drawing a train of cars at five miles an hour the boiler supplies the strength of 375 horses, and at 45 miles an hour the power expended is equal to that of from 700 to 800 horses. That's a curious fact, isn't it?—*Exchange.*

Cut vs. Cast Gears.

In reference to the comparative advantages of cut vs. cast gears, we may say in favor of the former, that the teeth being much more correct and regular in outline and more uniform in size with less black lash or play, they run much more steadily and smoothly, and with less friction than uncut do. There being no draft, the wheel has no "right and left" as with pattern-moulded wheels. But there is this to be said for the uncut, that the skin of the casting remains intact, and the material is more resistant to wear than if the softer material were exposed. In the matter of cast gears, those which are machine-moulded should have the preference over those cast from a whole pattern; because the teeth can be made more carefully, and moulded more perfectly; the draft being less and there being no twisting of the pattern. Of course, after the index machine and appliances are provided, the machine moulded gear is much cheaper to produce. The draft is but slight, which is an advantage.

In view of the different modes of manufacturing there are four different kinds of spur gears:—pattern moulded, machine moulded, cut gears, and mortise, or "core" wheels, with wooden teeth; the latter usually of a large size and a number of teeth, and gearing with metal toothed pinions.

Interchangeability is of no special advantage in bevel wheels, because they can work together only in pairs.—*American Journal of Railway Appliances.*

HANGING A GRINDSTONE.—To hang a grindstone on its axle to keep it from wabbling from side to side, requires great skill. The hole should be at least three-eighths or one-half inch larger than the axle, and both axle and hole square; then make double wedges for each of the four sides of the square, all alike and thin enough, so that one wedge from each side will reach clear through the hole. Drive the wedges from each side. If the hole through the stone is true, the wedges will tighten the stone true; if the hole is not at right angles to the plane of the stone, it must be made so, or the wedge correspondingly must be altered in the taper to meet the irregularity in the hole.

STEEL CASTINGS are fast coming into use everywhere. The iron foundries of England are complaining loudly of the rage which exists there at the present time for steel castings, and the consequently falling off of their trade. Wherever strength and trust-worthiness are needed steel castings are slowly but surely ousting iron ones. The number of steel foundries is rapidly increasing in England, and the consequent competition still weakens prices. Many iron founders would fain make steel castings also, if they could. But there seems little general prospect of substitution at present so trying have been the recent lean years.

TO WELD COPPER.—The *Mechanical Engineer* says it may readily be done in the following manner: "Get a can of concentrated lye, and put the contents in an iron kettle over the fire. Melt the lye (without water), and when it boils up take it off. Scarf the copper to be welded as you would an iron rod; take a good heat on it, and use the lye as a flux, dipping the scarfed ends in it just before bringing to a welding heat. We have welded copper rods, ⅜ inch in diameter, with this, so that no one could tell where the junction was."

PRESSED GLASS.—It is stated that pressed glass is turned out in the Siemens works that is as hard and tough as cast iron. It is far lighter and not affected by temperature, etc. It is intended to make out of this hard crystal, street lamp posts, stairs and gas and water pipes. It is thought these articles can be made 30 per cent. cheaper than in cast iron, but will not, of course, be so heavy.

COMPARATIVE SIZE OF THREAD.—Some one asks: "What size of thread should there be on a half-inch bolt to make it of equal strength with the bolt, the nut to cover the number of threads desired?" Answer: The question is not as clear as it might be, but we suppose our friend desires to know the proper number of threads on a half-inch bolt. Twelve to the inch will be found about right.

IF you are scraping surfaces in a bad light, get a new sheet of tin, and hang it so it will throw reflected light on the work.

SCIENTIFIC PROGRESS.

Facts in Electrical Science.

During the late electrical conference, held in Philadelphia, Prof. Roland gave a complete review of the advance of science from the earliest ages. In the course of his remarks on electricity, he said:

Let me now call your attention to one of the most wonderful facts connected with electrical science. When we are dealing with the electrostatic action of electricity, we find it is the so-called electric fluid which attacks the opposite. Not only do we observe the attraction of bodies oppositely charged, but the electricity itself on the two bodies is displaced by its mutual action. But when we come to investigate the mutual attraction or repulsion of electric currents on each other, we find an entirely different law. In this case the conductors carrying the currents attract or repel each other, but the currents within those conductors have no influence of attraction or repulsion to displace themselves within the body of the conductor. In other words, the current is not displaced by the action of a neighboring magnet, but flows on calmly as if it were not present.

This to me is one of the most wonderful facts in electrical science, and lies at the foundation thereof. It cannot be ignored in any further progress we may make in electrical theory, but points out a radical difference between electrostatic and electro-magnetic action.

I have now taken a rapid glance at some of the modern advances of electrical science, and we have not yet had to give up the old idea that electricity is liquid. To the profound thinker this idea is very vague, and there are some facts at variance with it, but it is still useful. We often hear persons say that this old idea is gone, and that electricity is "force," whatever they may mean by that. But let us see. The work or energy of an electric current between any two points is the quantity of electricity passed multiplied by the potential; this work goes to heating the wire. Let a current of water be passing in a pipe, and the quantity of water multiplied by the difference of pressure between two points, gives us the work which has been done in the intervening space, and which has produced heat. The analogy is complete. No electricity has been destroyed in the one case, or water in the other, but the work has come from the fall of potential in one case, and the fall of pressure in the other; the resultant is the same in both—heat. Again, we can obtain work from the mutual attraction and repulsion of electrified bodies, and the work in this case always comes from the change of potential between the bodies, while the electric charges remain undisturbed in quantity. Electricity, then, is not energy, but is more of the nature of matter.

So far for electricity in the state of rest or steady flow. But when it changes from rest to motion, all known liquids have a property known as inertia; furthermore, they have weight. But the electric fluid has neither inertia nor weight, as far as we have yet experimented, and in this respect differs from all known matter. Furthermore, we have never yet been able to separate electricity from ordinary matter. When we pass electricity through a vacuum, the resistance becomes less and less, and one may have hopes of finally having an electric current through a vacuum. But, as the exhaustion proceeds, we observe that the resistance begins to increase until it reaches such a point that no discharge can take place. Electricity cannot exist then without matter, a fact fatal to the idea of a fluid, however useful that may be. We have but one conclusion from this, and that is, that electricity is a property of matter. Do with it what we may, it can never be separated from matter, and when we have an electrical separation the lines of force must always begin and end in matter.

The theory of matter then includes electricity and magnetism, and hence light; it includes gravitation, heat and chemical action; it forms the great problem of the universe. When we know what matter is, then the theories of light and heat will also be perfect; then and only then shall we know what is electricity and what is magnetism.

It is the problem of the universe which looms up before us, and before which we stand in awe. The intellect of the greatest among us appears but feeble, and we all, like Newton, appear but as children on the seashore. But how few of us find the shells which Newton did, and how few of us try. The problem is vast and the means for its solution must be of corresponding magnitude. Our progress so far has been but small. When we push our inquiry in any direction we soon reach a limit; the region of the unknown is infinitely greater than the known, and there is no fear of there not being work for the whole world for centuries to come. As to the practical applications which await us, the telegraph, the telephone and electric lighting are but child's play to what the world will see in the future.

THE NEW COMET.—The new comet discovered by Dr. Wolf, on the 17th inst., has also been observed by Mr. Brooks, of Phelps' observatory, N. Y. It is now a telescopic object, readily discernible by 9-inch reflector. The coma is somewhat elongated in outline, and the nucleus is small, but bright and star-like. The comet is moving southward at the rate of about half a degree daily along the western edge of the constellation Pegasus toward the star Epsilon. About the middle of October it will be in the head of Pegasus. It is slowly growing brighter.

Prevention of Hydrophobia.

French science may claim a new title to the gratitude of humanity. While granting this, we do not wish to rush to the hasty conclusion that hydrophobia is to be banished from our midst; only, if we can believe our eyes and ears, it seems that we are within measurable distance of this glad state. What has Pasteur done? He has—if our information be accurate, and we have no reason to doubt it—done something to twenty-three dogs, thereby rendering them, at any rate for a time, incapable of suffering from rabies. Side by side with the free animals he has placed others which may be regarded as servile to the yoke of hydrophobia. Of the latter series, six were bitten by mad dogs, three of them becoming mad; eight were subjected to intravenous inoculation, all becoming mad; and five to inoculation by trepanning, all likewise becoming mad. On this showing, sixteen out of nineteen dogs died when a dose of the virus of rabies was sown in them; whereas, of twenty-three protected dogs, none succumbed, although the virus was brought in the most effectual manner into the tissues of each animal.

It is a well known fact that many more persons are bitten by rabid animals than suffering from hydrophobia. What the exact proportion may be is not satisfactorily known, but in dogs it would appear that about half the number become rabid. There are two explanations of the escape. The first is expressed by saying that no virus gets into the tissues of the body. The second suggestion, though possible, is less plain. It is to the effect that some organisms are unsuitable for the development of the rabid poison. There is analogy for this contention. Some individuals are believed to be insusceptible to the poison of scarlet fever, and this statement also applies to other acute specific diseases. The questioner of nature may ask how these facts are to be explained? And although we are on very unsafe ground, still science does afford some clew to a possible explanation. If we remember rightly, Sir James Paget has asserted his belief that a severe attack of typhoid fever may do away with the protection afforded by a previous attack of smallpox. Typhoid fever so modifies the constitution that the protoplasmic organism once again becomes favorable to the growth and development of the germs of smallpox. Inoculation with the attenuated virus of hydrophobia gives a dog immunity from the disease, just as similar treatment preserves a sheep from charbon; in other words, the physical basis of the canine organism is so altered that it no longer affords nourishment for the evolution of the poison of rabies.—*Lancet.*

AN AUTOMATIC STENOGRAPHER.—An English technical journal quotes as follows a "scientific gentleman": I believe that before long an instrument will be invented which will do away with the stenographers in our courts and offices. They were badly scared when Edison invented his phonograph, which would faithfully record the sounds of the human voice as well as those of musical instruments. That idea only needs to be developed to produce a machine that will answer all the purposes of the modern shorthand writer, and in fact be a more faithful recorder of all that takes place within its range, sounds such as laughs, sighs, moans, etc., that a stenographer cannot write, it being alike susceptible to. Another advance in this line would be a machine which would automatically write out these recorded sounds, as on a typewriter, and thus every man could be his own amanuensis. Inventors are looking into the matter.

CONCENTRATED GRAPE JUICE.—Italian vineyard owners propose a method by which the properties of grape juice can be concentrated. The water is to be artificially withdrawn in such a manner as to leave a residue, which contains all the possibilities of wine, and which can be turned into wine in places where the art of wine-making is rightly understood. The condensed substances will keep for years. The excellence of wine so made was recognized at the Bordeaux Exhibition in 1882.

MUSCLES IN A CATERPILLAR.—The microscope reveals that there are more than 4,000 muscles in a caterpillar, and that the eye of a drone contains 1,000 mirrors. There are spiders as small as a grain of sand, and they spin a thread so fine that it would require 400 of them to equal the size of a single hair.

MADAGASCAR A MAGNET.—Mons. Halley, a naval lieutenant, stationed at Madagascar, states that the soil of that island contains much iron, and that in approaching it the compass undergoes considerable and totally abnormal variations. It is, therefore, suggested that Madagascar may be an enormous magnet.

A GIGANTIC EARTH-WORM has recently been sent from Cape Colony, Africa, to the Royal Zoological Society of England. It is six feet five inches in length, and of a corresponding growth of body.

THE Zodiacal light is now regarded by French scientists as simply a reflection of light from the illuminated part of the earth upon an open stratum of the atmosphere.

MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO:
Saturday Morning, Nov. 1, 1884.

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Passing Events.

This being the last week of the Presidential campaign, the public interest has been mainly concentrated on political events, to the neglect of general business matters.

The United States Exploring schooner Ounalaska, from the North, where the party went to explore Putnam river, brings news of the discovery of the presence of gold, copper and coal, specimens of which were brought down.

There is very little news to report from the mining regions, aside from the notes we give in our mining summary on other pages.

On the date of this number of the PRESS, the new standard time goes into effect here. The railroads and ferry lines having adopted it, doubtless the public will do so at the same time. The new standard time is about 10 minutes faster than the local time of San Francisco.

THE fearful distress which has prevailed for some time past among the poorer classes in Madrid, has at last attracted the attention of King Alfonso's Government. In order to somewhat relieve the thousands out of work, contracts have been issued for building four hundred houses, intended for occupation by workingmen.

Copper Mining.

The "mass" copper mines of the Lake Superior region, in which the native copper is found unequally distributed in bodies weighing from a few hundred pounds to hundreds of tons, were those which in early times established the reputation of the district. Most of this class of mines have ceased to be of importance and even the few of the group that are now producers depend largely upon the crushing of lower grades of rock. The opening out of a vein of fair-grade ore is now-a-days of much greater importance to the copper trade than the discovery of a series of "masses." The principal deposits of which the copper of the Lake region is obtained are the so called "amygdaloid" and "conglomerate" rock, in which the copper is finely distributed in small grains. These are separated by stamping and crushing, yielding a product called "mineral," or copper mixed with a varying proportion of gangue, of iron and of moisture yielding from 40 to 90 per cent of ingot, a lower grade being usually made.

The treatment of ore from these two classes of veins does not differ in detail; but there is a wide variation in the cost of treatment, due to the fact that the rock from the conglomerate vein is much harder. So that it is profitable to work much poorer rock from amygdaloid beds.

Among the mines working conglomerate beds, the famous Calumet and Hecla is most widely known as the greatest producer and by far the most profitable undertaking. Working as it does a wide bed of exceptionally rich rock, carrying from 4 to 5 per cent copper, it stands unrivaled. With a splendid plant, paid for out of current earnings, it is in a position to produce copper and place it on the markets of the world at a rate lower than any known mine. It is supposed it can lay down copper at the seaboard for about 7 cents per pound. The brilliant results of this mine have frequently led to erroneous conclusions to the prosperity of the other producers of the Lake. The other mines cannot turn out large quantities at such low cost by any means. The Quincy, which works a high grade conglomerate produced in 1882, 5,665,796 pounds of copper at a cost of $9.50 per pound. The Atlantic, which treats a low grade amygdaloid, yielded at the same time 2,631,708 pounds of ingot copper at a cost per pound of $13.80 per pound. Some of the others, producing a million and a half pounds, produces it at a cost of 17 cents, and the Quincy was the only ore below 12 cents, except the Calumet and Hecla. With the low prices of metal now ruling, few of these mines can be profitable. The large mines of Arizona and Montana, with their fine ore and complete plants, can do much better than many of the Lake Superior mines.

Pacific Coast Ores, Rocks and Minerals.

At the University of California, Berkeley, they are doing good work in collecting, identifying and arranging the rocks, ores and minerals of the coast. The Museum of Petrography contains many foreign rocks, but is specially rich in California material, collected by the corps of the State Geological Survey and by Mr. C. D. Voy. The rocks are being arranged systematically and geographically, so that, as the collection becomes more complete, the geographical distribution of the rocks of the Pacific Coast will be known with great accuracy and detail. It is designed to issue as soon as possible a descriptive catalogue of the rocks of California.

The Museum of Economic Geology, although so recently founded, is already large, and is in frequent receipt of valuable acquisitions from all parts of the State. The importance and value of this collection can scarcely be overestimated. It will subserve two purposes: On the one hand, it renders possible a course of instruction in ore deposits, which is of essential importance to those who intend to pursue the profession of mining engineer; and on the other hand, the ore deposits of this coast will be collected together for the first time in one institution, where they can be subjected to careful and critical comparative investigation, in order that the laws of their occurrence may, as far as possible, be determined. To this end, an elaborate blank-book has been devised, in which are carefully tabulated the name, locality, form, thickness, dip, strike-wall rocks, etc., of every ore deposit on the coast, as soon as accurate information upon these points can be obtained. The mass of statistics thus obtained will be made the basis of the above named investigations.

The Museum of Mineralogy is very large and fully arranged, and is supplied with ample case room. It fully illustrates the instruction in mineralogy, and offers inexhaustible material for investigation, facilities for which are freely placed at the disposal of the student. Mr. A. W. Jackson, the instructor in mineralogy, petrography and economic geology, is an enthusiast in these special branches, and has taken great trouble in the collection, identification and arranging of the specimens. All of the museums are open at all times to the public, Mr. Rivers being in constant attendance to show visitors through the various collections. Miners who come to the city will find much to instruct and amuse them by a visit to these collections.

Foreign Sources of Lead.

The United States has now became so large a producer of lead, that the development of the lead mining industry abroad is of comparative unimportance to us, as we have practically ceased to import. Yet, as we must each look out for other markets than our own, it is well for us to take some cognizance of what is going on elsewhere. The great rival of the United States as a lead producer is Spain, the principal seat of the mining industry there being in the province of Murcia, on the southeast coast. The production has of late years steadily increased there, in spite of the fall in prices. The statistics of the lead made in England, show the growing weakness of English producers, who are struggling with difficulty against foreign competition. The English desilverizing works formerly handled the bulk of the silver-bearing lead of Spain, but local desilverizing works have diverted much of that business. Great Britain produced in 1881—the latest figures at hand—48,587 tons; imported 43,400 tons; exported 43,109 tons, showing the home consumption to be 98,878 tons. The destination of her exports are of interest to us. Of the 43,109 tons, 8,355 went to Russia, 1,041 to Germany, 3,390 to France, 598 to this country, 12,824 to China, 3,349 to British India, 4,715 to Australia, and the balance to other countries.

The figures relating to China interest us most, as that country takes about 20,000 tons a year, the bulk of it from England, and most of the remainder from Germany. The latter country produced in 1881, 85,989 metric tons, and in 1882, 91,690 metric tons. Nearly one-half the production of lead in Germany must seek foreign markets, and they exported in 1882, 41,875 tons of pig sheet and manufactured lead.

No other countries than those mentioned are great lead producers. Greece exported in 1881 over 11,000 tons of lead. France produces some, and desilverizes and refines quantities from the mines of Greece. Australia, Russia and Italy produce small quantities. Outside of Europe and the United States, Mexico is the only country which does a local smelting business. The little base bullion that is made there goes mainly to England. The lead is usually cupelled at the mines, the silver alone reaching the markets, owing to the inaccessibility of most of the mines.

IN his annual report the Governor of Idaho says the funded debt of the Territory has been practically wiped out. The population is stated to be 88,000, which should entitle the Territory, in the Governor's opinion, to be admitted into the Union as a State. The value of the assessed property in the Territory has increased 50 per cent over last year, and is now placed at $9,380,000. The export of minerals during the last fiscal year was $7,000,000.

THE lease system has been adopted in nearly all the camps of Colorado and in many sections of New Mexico and Arizona. Generally speaking, it has given satisfaction, and where properly used, will in nearly all cases result favorably.

THE Small Hopes Mining Company paid a dividend of 15 cents per share on the 8th, amounting to $37,500, and making a total of $587,500 this year.

THE Father de Smet Mining Company has declared a dividend of 20 cents per share, or $20,000, payable at New York on the 31st.

Dillon, Montana.

This town, the capital of Beaver Head county, is the largest place on the Utah and Northern R. R. south of Butte, until we reach Ogden. It lies on the west bank of the Beaver Head river, in the midst of the valley of that stream, which extends for many miles north and south of Dillon, affording one of the finest agricultural sections in Montana. Dillon is the home of many farmers who have lands adjacent to the town. It is the central trading post for several mining camps to the east or west. Argenta and Bannack cities lie to the west, with a good stage road leading to them. A stage road also leads off to the east, extending to Virginia city, which is some 40 miles distant, Dillon being its nearest railroad point. Branches from this stage road lead up to Laurin, Sheridan and other places, all of which are more or less tributary to Dillon. Accordingly, we see in Dillon a rather thriving village, made so since the railroad came to it. In 1880 it had hardly any population for enumeration by the United States census; now fully 800 to 1,000 souls occupy the town. There are a few extensive dealers in merchandise, whose business extends to the points previously named, and who are in reality jobbers or wholesalers. There are two banks, the First National being the most extensive, but both do a good business. Many new residences are being erected in town, most of them of a neat and tasty appearance, with plenty of yard room and the commencement of pleasant surroundings. Ditches along the streets convey running water from the river all through the village. There has lately been erected a large, fine school building, of ample accommodation for the school children of the place for several years. The town contains one of the finest weekly papers of the Territory—the Dillon *Tribune*, whose circulation extends over into Western Idaho, as well as through all southwestern Montana. Altogether, Dillon is a fine representative of the flourishing young cities, which are now springing up in Montana, whose incipiency and growth are the result of present activity in mining matters, or the direct result of railroad connections which hitherto have been denied them. They have found a market for the products of the soil; they have obtained a ready means of importing goods to be sold to the out-lying country, and there is a general stimulation to the development of local resources. The town has many years of prosperity before it.

NOTES FROM PHILLIPSBURG, MONTANA.—While at Butte City recently, our agent met M. Connolly, Esq., of Phillipsburg, who furnished a few items about the camp. The principal mines of the town are the Hope and the Granite Mountain. The former company employs some 75 to 80 men. They own their own mill, which is the oldest silver mill in the Territory. They work some 25 tons of free milling ore per day, and get good results. The Granite Mountain Mining Co. employs some 150 men, and take out 25 to 30 tons per day. The ore is very rich, but contains much base metal, requiring to be smelted. Much of the ore assays $200 per ton. Works for this company are now going up. Although Phillipsburg is one of the older mining camps in the Territory, it is not yet worked out, and there are said to be good chances for investment there.

ONE of our copper works has closed a contract for 1,000 tons of from 4 to 5 per cent Newfoundland copper ore, a circumstance that shows that it would be possible for our American works to control the whole of that smelting business, if the government would allow them the full drawback for copper in imported ores, when re-exported, instead of retaining a part of the duty paid, as it now does.—*Exchange.*

THE Director of the Mint estimates the production of mines in the United States during the calendar year 1884 at $29,000,000 gold, and not quite $2,000,000 more silver than for the previous year.

THE Plumas Eureka Mining Company paid a semi-annual dividend of 37½ per share, or $53,375, at London recently.

THE dividend of 12½ per share by the Sierra Buttes mine, paid at London this month, aggregates $15,064.

Lumber Chutes on the California Coast.

The shore line of the west coast of the United States has very few good harbors. Between San Francisco and the straits of Fuca, some 700 miles, there is really not a single harbor which is always accessible during gales. There are a number of open roadsteads, giving partial shelter from the summer northwest winds, and several bar harbors, all of which are dangerous of access and utterly impracticable in heavy or even moderately bad weather.

For nearly the whole length of the northern coast, the immense forests, extending back for miles from the shore, furnish employment for labor and investment for capital. At every available point for shipment stands a saw-mill, turning trees into lumber which is sent here by sea and thence distributed. Every little river has its fisheries and canneries, and all the valleys and bottom lands their agricultural population.

The produce is mainly shipped by sea and under the peculiar existing conditions the people have had to devise means to overcome the natural disadvantages of the coast line. From these necessities has grown up the "chute system," of loading and discharging vessels, which it is the purpose of this article to describe. As stated, the rugged character of the coast line is such, that there are few harbors or landing places where it is possible to maintain a wharf, so that chutes have to be constructed. Most of these chutes are on the coast north of San Francisco, although there are a few on the south coast also. These chutes consist of a long incline of wood in the form of a shallow trough, extending from a headland of a shipping point, or from a high wharf or pier, out to a point where water is deep enough to allow vessels to come under and load. Of course, no average can be given of their length, size, cost of construction, or length of shears. These items all depend on the location and conformation of the coast. In some cases they are 60 feet long, as when used from a wharf or pier, and in others 600 feet or more. The length depends entirely upon the vertical hight from sea-level, to the point from which the lumber is started. There must be inclination enough for lumber to slide by its own weight, and yet not so much that its impetus will be too great. In practice the angle is about 30 degrees, though in very long chutes it is common to give them much more pitch at the start, and have the lower end nearly level, or even ascending a little to check the force or speed of the sliding lumber. This is done for several reasons. First—In a long chute it would be nearly impossible, except at great expense, to preserve a true line of incline, and there is always more or less sag on account of the lightness of construction. Secondly—If the headland was high it would often be impossible to obtain the correct inclination without great expense and a very long chute, perhaps too long for service, and extending clear across the harbor. It is usual, therefore, to pitch them sharp at first and then graduate them to suit. No part of the structure ever touches the vessel, except by accident, but the whole thing is suspended from the various shears of supports, and the outer end or apron is raised or lowered to suit the stage of the tide, hight of vessel, and weight of lumber, according as it is light or heavy. In stormy weather they are, of course, hoisted high in the shears.

A LUMBER CHUTE FOR LOADING VESSELS ON THE CALIFORNIA COAST.

At the lower end and close to it, say within ten or twenty feet, is a break, or "clapper," as it is usually called, which consists of a heavy flap of planks, faced smoothly with iron on its lower underneath edge. This is hinged to the top edges of chute, and the lower edge rests on the bottom. A lever handle is fastened to a frame on one side, connected to the clapper in the center with an iron bar and extends through a similar frame on the other side, allowing the clapper to be raised on its hinges. When shipping lumber, a man is stationed at the clapper, and a couple of boards at a time are shoved down the chute. They slide down rapidly at first, and the impetus given carries them to the clapper. As they reach it the man there raises it enough to allow them to go under, and, as they slide, puts his weight on the lever, slowing them down or stopping them with their ends sticking over the vessel. The vessel is moored directly under this end, with the chute about breast high above the deck, and the boards are seized by the men and passed below or stowed on deck, as the case may be; the apron being raised as the load is put on or tide rises. This is for boards or small timber. In shipping large timber, another brake is put on higher up, consisting of several long planks held together by cross pieces on top, and hinged at the top the same as the clapper, with a rope running from the lower end through a block overhead to the upper end of the chute. As the timber runs down it goes under this flap, and its force is checked by the weight and friction, a man at the rope regulating the same, so as not to stop it altogether. When it reaches the clapper its force is so spent that the man can then stop it. It is a very nice job, all this brake business, to apply just the required amount of check at the right time, and can only be learned by experience.

These chutes are, with few exceptions, placed on the north side of the landings or coves, that side being usually the highest, with a reef extending out, which affords pretty smooth water during the prevailing northwest winds of the shipping season. The peculiar formation of the coast brings nearly all the chutes on the north side of the landings.

The engraving which we have had made to accompany this article shows a typical chute. Some are much smaller and some more elaborate. The engraving was made from a photograph of Rockport chute, Mendocino county, formerly known as Cottanueve, a landing only considered available for six months in the year, and by no means the best on the coast at any time. Nevertheless, considerable money has been spent here in improving it as a shipping point. An isolated rock off the beach, which was so precipitous and pointed as to have a foothold at its pinnacle for only one man to work at first, has been cut down until it presents a surface available for storing over 200,000 feet of lumber. From this rock to another nearer shore has been stretched a wire suspension bridge, costing over $13,000, and the horse-cars bringing lumber from the mill come on trestle-work to the bridge, and cross it to the other rock. Everything is of the most substantial character in the work done. The chute comes down from the outer rock, where the lumber is piled. There are guys, stays, and braces to steady the chute, and regulate the inclination as well.

These conditions are peculiar to the California coast, there being no other part of the world where this chute system is in vogue. They are built on all sorts of places along the coast. The extreme edge of a headland or point is often selected on account of depth of water. It must be remembered that the ocean surf is constantly rolling in, and even behind many of the small points or headlands there is a heavy swell. In many places the insurance men refuse to take risks on the vessels, on account of the danger of loss.

THE "PHILOSOPHER'S STONE" IN CHINA.—An eastern writer declares that there is now no reasonable doubt that the old Arabian alchemists and others derive their ideas on the transmutation of metals into gold and the belief in immunity from death by the use of the philosopher's stone from China. Mercury is stated to have been the philosopher's stone of which Geber and others wrote, and cinnabared red sulphuret of mercury was known to the Chinese as early as the seventeenth century. Chinese medical books says it takes 200 years to produce cinnabar from mercury; in 300 years it became lead; in 200 years more it becomes silver, and then, by obtaining a transforming substance called "vapor of harmony," it becomes gold. This doctrine of transformation is over 2,000 years old in China.

A DEPRAVED TASTE.—In the Dublin Zoological Garden a fine lioness has eaten her own tail. One day she removed 12 inches of this appendage, and after an intervil resumed her repast and swallowed more. Efforts were made to heal the bleeding stump, but the lioness kept on eating it. The tail has almost entirely disappeared, and she has now commenced to eat one of her fore paws.

EXTRA thin saws require more teeth than thick ones.

The Assay of Nickel and Cobalt Ores.

[Written for the MINING AND SCIENTIFIC PRESS by C. H. AARON.]

Mitchell says the assay of nickel and cobalt is the most tedious, except that of the platinum group of metals, and Crookes, in his edition of Mitchell retains the statement, though substituting a better process for that of Mitchell. I have been at work for many months in the attempt to find a comparatively short and easy method for the assay of these troublesome metals. I am not yet prepared to say that I have quite succeeded, though I think I shall soon be able to announce an entirely new method, which, if not quite so accurate as some that we possess, will commend itself as accurate enough for many purposes, and much more convenient and rapid than other processes.

In the meantime some facts have come to my knowledge, which do not appear to have been worked into any method of assay to be found in the books, and as the subject is one of some interest, in view of recent discoveries of nickel and cobalt in California, Oregon and Nevada, I will venture a suggestion or two.

Supposing the ore to contain, besides nickel or cobalt, or both of these, Fe., Mn., Cu., Au., Ag., Bi., Pb., Sn., As., S., Sb., Te., Ca., Al., Mg., Ba., Sr., Si., or some of them: Dissolve in nitro-hydrochloric acid; dry, take up, filter; add sodium acetate to the not too acid filtrate; boil, filter; add citric acid, pass hydrogen sulphide, filter and wash with the usual precautions. To filtrate add ammonium chloride, then ammonia, which will throw down a part of the nickel and cobalt, by virtue of the hydrogen sulphide present. Complete the precipitation by means of ammonium sulphide (colorless or yellow); warm, settle, filter, and wash with water containing ammonium sulphide. The precipitate on the filter consists of nickel and cobalt sulphides, the manganese and all but traces of the earth having passed off in the filtrate. Dissolve out the nickel sulphide by a cold solution of potassium cyanide, which leaves the cobalt sulphide undissolved.

To the solution of nickel, separated from the cobalt sulphide by filtration, add hydrochloric acid; filter and calcine the washed precipitate, also the filter. Weigh as nickel oxide containing 78.67 per cent of nickel. Convert the cobalt sulphide to sulphate, the filter being burned and the ashes added, either by roasting or by treatment with strong nitric acid, adding in either case a little pure sulphuric acid at the last, and heating to dull redness, until no more fumes are given off, and the weight remains constant. The final heating is best done in a platinum crucible, which must be covered. The cobalt sulphate when cold should have a fine pink color, and should be completely soluble in boiling water. If the color of the cobalt sulphate is not satisfactory, it may be redissolved in boiling water and a little hydrochloric acid, the solution filtered if necessary, sodium acetate added and hydrogen sulphide passed. The cobalt sulphide thus precipitated, collected on a filter and well washed, must be again converted to sulphate. It contains 38.06 per cent of metal.

Another method which is a little more troublesome, but also more accurate, is to dissolve, and treat with sodium acetate and boiling as before; then add acetic acid, pass hydrogen sulphide, collect the precipitate on a filter, redissolve it and the burned filter, add potas-

(Concluded on page 284.)

Improvement in Smelting.

Competition to the Smelting Monopolies.

There is a popular belief among newspaper writers in mining sections that if a low railroad rate could be obtained, that the mines of their section could and would at once double the amount of their ore shipments. Such statements are extravagant, yet they are very common. The Denver *Tribune-Republican* says: Gunnison City is now an ore market where (so it is affirmed) miners can get a crisp new five-dollar bill (or its gold or silver equivalent) more for each and every ton of ore than can be paid by either Pueblo or Denver smelters. Assuming this latter statement to be absolutely true it should cause a heavy increase in the output of the mines of Hinsdale, Ouray and Gunnison counties, because it amounts to the same thing as the railroad freight reduction they have been clamoring for. Mr. Moffet of Gunnison announces that he will buy all the ore offered to him at these rates, and even better, and that he will treat it too; that if a larger plant (no limit mentioned) is necessary, it will be erected. Now since the Jumbo roaster acts best upon the ores which are worst for other smelters and as no such thing as refractory ores are known or recognized by the Gunnison Jumbo Works, we acknowledge that the Pueblo and Denver works cannot compete with either the performances or charges of Mr. Moffet unless they can get a supply of his magic roasters. Gunnison has a chance to take the wind out of the sails of all valley smelting plants if she will only enlarge her works and guard sacredly the secret of jumbo-roasting. There is no use denying what is self-evident for the sake of endeavoring to bolster up our waning prestige as a smelting point. Our smelters cannot operate under the competition of $5 00 per ton on each ton of ore they must use to run their extensive works, and hence they must have jumbo-roasts or shut up shop. The only hope for the valley establishments, lies in the chance that Mr. Moffet will not press the limit of his wonderful invention by erecting a plant large enough to treat all the ores of the State and adjoining Territories. The New England and Colorado smelting plant at Pueblo has now a rival worthy its metal, as it will be remembered that that company advertised "back East" that there was $10 profit on each ton of ore smelted in Colorado. With the Gunnison Moffet jumbo-roaster and the Pueblo, New England & Colorado works in full blast, it will be very cold weather and trying times for Leadville, Pueblo and Denver water-jacket smelting establishments.

The following from the Gothic *Record* explains the Jumbo and intimates that our smelters may be able to negotiate for roasters and thus be able to keep their works in operation: The last

Run of the Moffet Smelter

In Gunnison, for ninety-six consecutive hours, on the most refractory of Silent Friend and North Star ores, has opened a new era in ore treatment. Since smelting became a great industry, it has been considered an impossibility to successfully treat heavy, black-jack zinc ore in any known furnace, without using an immense quantity of free lead ores as fluxes. But Mr. Moffet, after years of patient study and costly experiments, has at last demonstrated that the heavy zinc minerals can be easily and cheaply reduced, and every iota of silver saved.

On Saturday morning, the 20th of September, the Moffet smelter in Gunnison was started upon a lot of Silent Friend and North Star truck that contained, by actual tests, only 8 per cent of lead and over 30 per cent of zinc. The ore was first run through a Jumbo roaster; and in that roaster lies all

The Secret of the Success.

Instead of the old, slow labor and costly method of roasting, the Jumbo does its work cheaply and rapidly. It is apparently only a cast-iron, open fireplace, surrounded by a water jacket. The ore and a little coal are thrown in and fired. A number of heavy air blasts are turned on, which soon fires the sulphur in the ore, creating an intense heat that soon melts the mineral into a wax. The melted mass is forked into a tank of water, where it granulates into a soft mass of oxided ore. As the melted truck is moved from the fireplace, more ore and coal are added, and as the great heat, generated by the coal and sulphur, very soon does the work, the cost of roasting is only a small amount.

Over the fireplace there is an immense suction air pipe, that grabs every particle of the fumes and gases, fully 50 per cent of the lead and all of the zinc and sulphur being converted into gas and mineral fumes. These are forced through a long tunnel that connects with a houseful of long sacks, into which all the mineral smoke collects in the form of a fine, white dust, the sulphur gas passing off through the fiber of the sacks. The zinc that remains with the lead and silver in the fine dust has its refractory nature so changed that it, with the lead, makes an excellent flux. It is mixed with the roasted ore, a little lime and iron added, and the result is a clean lead bullion, containing every particle of gold and silver ever in the ore.

Mr. Moffet's late successful run is the commencement of a new era of prosperity for Gunnison county miner. It insures the working of hundreds of mines that heretofore have been considered valueless because of the quantity of zinc in their ores. Mr. Moffet proposes to place one or more of his furnaces and roasters in every mining camp in the county. He says that it is much easier to draw the fuel to the ore than to move the ore to the fuel; and as he does not require a great variety of minerals, nor does his furnace take over one-half the fuel used by the old method, his success is assured, and prosperity in the mining camps a foregone conclusion.

The capacity of the Gunnison works will be increased, a large refinery erected, in which the bullion from the outside furnaces will be separated, the silver being shipped in fine bars and the lead reduced to a white lead, to supply the markets of Colorado and the entire West.

Cables for Drawing Freight Wagons.

The Nevada *Transcript* says: A gentleman now residing in San Francisco writes as follows to Peter Purdon, owner of the toll bridge across the South Yuba river between this city and North San Juan:

"An idea has struck me, and such a thing occurs so seldom that I feel constrained to communicate it.

"You must know that I have, and always shall have, great interest in Nevada City and all my old friends in that town. Therefore I am not at all pleased with their being cut out of ever so little of the up-country trade by the building of roads intended to divert it to other points.

"For the sake of Nevada City I would suggest something which, if it can be carried out, I am certain will attract all travel from above there to the Purdon gate. Cut a road straight up to the top of the hill, not varying an inch to the right or left—no difference how steep—and on this lay a cable operated by a water-wheel, with which you could hoist the largest wagon to the top in 15 minutes and let it down in the same time. The cable would be the principal item of cost, but that would not be great and it would last a life-time. You would have free water power, so it would cost you nothing to operate it. If the road should be so steep that the horses could not go up, they could be sent around the old road, but horses could climb a pretty steep hill without a load, and with the great saving of time and wear and tear on teams and vehicles, teamsters would choose your road in preference to any other."

Mr. Purdon says the only thing that stands in the way of the idea being practicable is the great outlay required for the cable, but we are satisfied that it would not cost near as much as he guesses it would. By laying pipe a mile up the river, plenty of water, with a 60-foot pressure, could be obtained, and the wheel and pipe would not be expensive. Neither would it cost much to build the short stretch of road needed. Once built the cost of maintaining and operating the cable road would be insignificant. Mr. Purdon's records show that an average of 765 freight teams (with an average of three tons of freight to the team) go over the road annually, besides a large number of lighter vehicles. The only question with him is, what would the building of the cable road cost, and would the returns from the traffic warrant the outlay?

COPPER AND ITS NEW USES.—It is now a recognized fact that of all the base economic metals, copper stands at the head and is gradually asserting itself in new channels. An English exchange says the Broughton Copper company (limited), has now on view at its works, Bronghton Road, Salford, two exceedingly large hydraulic rams, which it has succeeded in covering with a copper tube in which there is not a single joint. The rams are 27 feet long and 10 inches in diameter, and have been made for the Victoria Graving-Dock company, London. This company has in use 32 rams, and has hitherto experienced great difficulty on account of the corrosion of the cast-iron rams that it now uses for hydraulic lifts. For some time, it has been found possible to cover small rams with copper, but attempts to cover very large rams with the same metal have generally failed. This has arisen from the fact that the ontside copper tube has usually been constructed in sections or lengths, which it was found impossible to join so closely as to prevent the water from getting through. The difficulty has been got over by the Broughton Copper company, by the construction of a tube one eight of an inch in thickness, of the same length as the ram. This tube has been fitted with the greatest nicety around the ram, and, being without a single joint or opening, it seems impossible for water, in however a small quantity, to get to the iron ram inside. The longest copper tube exhibited at the Paris Exhibition was 25 feet in length. The tubes just manufactured by the Broughton Copper company are two feet longer, and are, therefore, among the largest ever produced.—*Lake Superior Mining Gazette.*

THE announcement is made that the ten business establishments engaged in steel rail manufacture in this country, have agreed to work on half time only from January 1 to July 1, 1885. There are, all told, thirteen mills, four of which are out of operation and likely to remain so until prices of rails advance considerably.

To Find the Value of a Specimen.*

Handsome specimens of gold in quartz are in great demand. There are many rules for ascertaining the proportion of the gold in such specimens, all based on the different densities of the specimens as a whole, of the gold, and of the quartz. The specific gravity of the gold and of the quartz is generally assumed, the former at from 17 to 19, the latter at 2.6. That of the specimen is found by weighing it in air and in water, and dividing its weight in air by the difference. In this case the easiest rule to remember is this:

Divide the specific gravity of the gold by that of the quartz and by that of the specimen. From the greater quotient subtract the lesser; the remainder is the *proportion* of gold. From the lesser quotient subtract 1; the remainder is the *proportion* of quartz.

Then, as the sum of these proportional quantities is to the proportion of gold, so is the weight of the specimen to the actual quantity of gold in it. Suppose a specimen weighs 32 ounces in air and 28 ounces in water—the difference is 4; and 32 divided by 4 gives 8, which is the specific gravity of the specimen. If the specific gravity of the gold is assumed to be 17, and that of the quartz 2.6, we have 17 divided by 2.6 gives 6.539 nearly, and 17 divided by 8 gives 2.125. Subtracting the lesser quotient from the greater leaves 4.414, and subtracting 1 from the lesser leaves 1.125, and the *proportion* is 4.414 of gold to 1.125 of quartz. Adding these together we have 5.539. Now it is a mere question in the rule of three. If 5,539 ounces of the specimen contain 4,414 ounces of gold, how much does the whole specimen weighing 32 ounces contain? Answer—25.5 ounces. This is correct, provided the assumed specific gravities of the gold and gangue are correct; but if greater accuracy be desired, proceed thus:—

Weigh the specimen, a piece of the metal and a piece of the gangue, each in air and in water. Divide the difference between the respective weights in air and in water by the weights in air. From the greater quotient subtract the next less and from that the least. The first remainder is the *proportional* weight of the metal; the second is that of the gangue; the sum of these is that of the specimen. Having the actual weight of the specimen, that of the metal is easily found as before by the rule of three.

Suppose a specimen of native silver in spar weighs 84 pounds in air and 73.5 in water; a piece of the silver weighs 27 grains in air and 24 in water; a piece of the spar 26 in air and 12 in water, then:—

Spar in air.....20
Spar in water.....12

Difference.....8 ÷ 20 = 0.400

Specimen in air....84
Specimen in water. 73.5

Difference.....10.5 ÷ 84 = 0.125

Silver in air.....27
Silver in water.....24

Difference.....3 ÷ 27 = 0.111

And 400—125 = 275 proportion of silver
" 125—111 = 14 " spar

289 = " specimen

Then 289 : 275 :: 84 : 79.93 pounds of silver in specimen.

The difference between the weight in air and in water of a piece of rock, metal, etc., may be found in several ways, according to the facilities at hand, as follows:—

Weigh the object on scales or steelyard of suitable delicacy. Suspend the object by means of a hair, a fine thread, or a wire, according to its weight, under the pan of the scales or from the hook of the steelyard; submerge it in water and again weigh it. Subtract the second weight from the first.†

Or, weigh the object; take a suitable-sized vessel full of water, or in which the water stands at a certain mark, and weigh that and the object together if convenient, or if not, weigh them separately and add the results. Now remove some of the water, place the object in the vessel, replace so much of the water as to raise it again to the mark and weigh again. The difference between the last weight and the sum of the weights of the object and of the vessel of water, is the weight of the water displaced by the object, which is equal to the difference of the weight in air and in water. This method is suitable for sand. Special bottles, called specific gravity bottles, graduated to hold a certain weight of water, may be bought with counterpoise. Price, $1.75 to $3.50; capacity, 100 to 1,000 grains; also, 100 grammes.

The weight of the object in air, divided by its difference in water, is the specific gravity. The difference, divided by the weight in air, is the specific displacement. From either of these the proportional quantities of two different substances composing a mixture can be determined by the rules given for the valuation of specimens.

*From Aaron's Assaying of Gold and Silver Ores, published by DEWEY & CO., 252 Market St., S. F.

†Some scales are provided with a hook, from which the object can be suspended above the pan. A little bench of sheet-brass or the like is then placed across the pan, leaving the pan free to move beneath it, and a vessel containing water in which the object is submerged is placed on the bench.

Lost Ledges.

A short time since we reprinted from the *Calico Print* the letter of a correspondent in which he referred to the legends of "lost ledges," in the desert regions of Southern California. The following is from the same source: Here it might be well to mention two very singular finds of rich gold ore that were made in the Old Coso district, one by Dr. French, in 1860, consisting of a mass of float rock, of about 250 pounds in weight, lying on a hillside, apparently as if dumped in one pile, from the sale of which he realized several thousand dollars; the other was found in 1864 by Lime Martin and John Sbipe, and consisted of a block of quartz some 2 feet in width, 15 feet long and 4 feet high, also penetrating the ground to a depth of 6 feet. From this mass of quartz they realized some $4,000. There is no myth about these finds, but actual realities. Some were inclined to think that the latter might have been the Alvord mine, but the ore in either case was not of the same quality as the Alvord specimens.

It would be impossible for the reader of the present day to realize the interest that was taken by the prospectors of those days, from '60 to '63, and how frequently and with what interest the subject was brought up around the camp fires.

Men would form in parties of 5 or 6 and start usually from Keyesville, on Kern river, and their movements were watched with deep interest by all, and when they would return all were eager to hear the result of the trip. The writer was personally acquainted with many of these early pioneers of the desert, and thinking that perhaps this may meet the eye of some of them, he will name several as a gentle reminder of old times, if for nothing more. Dr. S. G. George, Jas. Farley, Jim Hitchings, Darwin French, Zeke Leslie, Wm. Henderson, Frank Whitson, Joe Summer, Lime Martin and John Sbipe. These men were practical miners only in a limited degree; they knew gold ore when they saw it, but had very little knowledge of silver ores or the manner of treating them, hence their time was given principally to prospecting for gold. It was from them that a knowledge of water and springs was gained, that helped the prospectors in later years.

Occasionally one or two men would start out on the desert and never return. One such instance bore considerable mystery, and in a manner forms also another lost mine to add to the first. In the fall of 1862 two men came into the station at Little Owens lake. They had a single jack, and looked as though they had been on a long journey. They said they had been out on the desert prospecting. They went on to Keyesville, and in a short time returned, having three jacks well loaded with supplies. The writer here saw them, and asked where they were going. "Oh, out towards Death valley," was all the answer he could get. In regard to their having found anything previous they would not say, but that they were well supplied with tools was quite evident, having a large mortar, a hand saw, picks, shovels, etc. They took an eastward course from Little Lake, regardless of all trails, and they were never again seen or heard of, and as the Indians of that region broke out a few months afterwards, it is supposed they were killed, and if they had a gold mine of great value, it still remains undiscovered. This was followed the next year by

Another Mystery.

Two men were traveling in company through from Aurora to Keyesville; they camped for the night on the Sierras at Chimney Meadows, at the head of Nine Mile canyon. Shortly after making camp a stranger came up. He said he had been on the desert, and was out of grub. They of course shared with him, and after supper engaged in a game of cards. Soon a quarrel arose between the stranger and the other two, the result being that the stranger received a death blow from a stick of wood, and was buried by the murderers, who, upon looking over his things, found some quartz of a peculiar character, and from appearances but recently broken off the ledge. They cached the most of this ore and returned to Aurora, not wishing under the circumstances to go on to Keyesville. One of these men afterwards spent considerable time in trying to find the mine, but without success. The peculiarity of the ore consisted in its being a white quartz, stained with green, carrying sulphurets of copper in massive form, and pure gold; also, metalic copper, mingled with and dispersed through the sulphurets. No mine with ore of that character has ever been found upon the desert to the writer's knowledge. Following this came the celebrated

Bryfogle Mine.

Along about 1865 or '66. This was nothing more than another Alvord find, and gave rise to as many different stories. Bryfogle wandered southward from Belmont, in Nevada, to the desert, and of course got lost. Upon his return, others went out with him to find his mine, specimens of which he exhibited, telling some that it was from float, and others that he had found the ledge. Hundreds of dollars, besides weeks and months of travel, have been wasted in the vain search for this mine. There are several other lost mines of quite recent date, but which have attracted little attention compared to those of earlier date, and prospecting on the desert has become a very undesirable occupation, horse feed and water being very scarce,

ENGINEERING NOTES.

Electric Boats.

M. Reckenzaun believes that on boats of moderate dimensions electricity can be advantageously substituted for steam. The motor should always be ready to act, and should occupy the least possible space. The duration of action is of little consequence, since the distances to be traversed are generally small. An electric boat can carry twice as many passengers as a steam boat; consequently it can be smaller, cheaper and less difficult to drive. Electricity has the additional advantage, especially in pleasure boats, of avoiding smoke, smell, noise, and the inconvenient presence of the boiler. It is not long since a steam canoe carrying fuel sufficient for seven hours' consumption was considered a marvel; electric boats already surpass this limit. During the past autumn an electric canoe made numerous voyages on the Danube, under excellent conditions, and there is reason to expect that even ships of considerable size may be finally driven by electricity.—*Chron. Industr.*

SOUND PRACTICE AND SCIENCE.—In an article on the prospects of young engineers the London *Engineer* thus alludes to the necessity of combining practical knowledge with scientific attainments in order to achieve commercial success: "We often hear German and French engineers extolled for the results of their scientific training. What are the locomotives or marine engines which have resulted from it like? The Americans have been the least scientific engineers in the world, yet they have modified engine building practice all over the world. Germany and France have been unable to compete with us without buying engines from us to copy. Science may prevent a man from making enormous mistakes; it cannot tell him how to produce even moderate commercial successes. Standing alone it is entirely helpless in commercial mechanical engineering—combined with sound practice it is useful."

CALIFORNIA RAILROAD NOTES.—The San Joaquin and Nevada Railroad is now within two miles of Mokelumne Hill, toward which it is being pushed. It is now in a rich fruit country, and will open up also lumber and mining countries. The road is running toward the Yosemite. The valley travel will eventually go by this route, which will greatly reduce the present staging. The San Francisco and North Pacific road is pushing its track north from Cloverdale toward and into Mendocino county. Work is also in progress on the railroad from Elcho to Susanville, in Lassen county, on the eastern flank of the Sierras. Here is another region which is without railroad facilities, and which is comparatively little known. Those who have examined the country state that it is rich and capable of supporting a very large population, which can be made to offset the loss of Oregon and San Francisco trade.

JOINING THE ARAL AND CASPIAN SEAS.—The preparatory measures for the junction of the sea of Aral with the Caspian Sea, have reached a further stage by the return to St. Petersburg of the Russian expedition which has been surveying the route. The Russian Government was so convinced of the importance of the proposed water-way, that General Gluchowsky, the originator of the idea, was sent at a cost of nearly £100,000 with a corps of experts and engineers to make the necessary investigations. The results of this step have not yet been made public, on the ground of their being under examination by a commission. It is, however, concluded in some quarters that the silence of the official press indicates the non-fulfilment of the original expectations.

CONNECTING THE NORTH AND BALTIC SEAS.—The project of cutting a ship canal across the province of Holstein, connecting the North sea with the Baltic, is now being taken up by the German authorities in earnest. The canal is to run from near the mouth of the Elbe to the harbor of Kiel, Germany's chief naval port on the "Ostsee." It is to be constructed of such dimensions as to permit the largest ironclads in the German navy steaming from the Baltic to the German ocean, or *vice versa*, thus avoiding the necessity of making, as at present, the long voyage round the peninsula of Jutland. Detailed drawings on the subject are to be submitted to the new Reichstag.

A SHIP CANAL ACROSS IRELAND.—Plans have been prepared for a ship canal across Ireland from Dublin to Galway—a distance of 127 miles. The estimated cost for ships of various sizes is as follows: For ships of 1,500 tons, $40,000,000; for ships of 2,500 tons, $60,000,000; for ships of 5,000 tons and upward, $100,000,000. The plans have been prepared by a London engineer assisted by Captain Eads.

A SINGULAR RAILROAD INCIDENT.—An incident unparalleled in the history of railroading occurred on the Missouri road, between Lincoln and Denver. A train of eight cars loaded with coal was blown a hundred miles by a tornado, the speed much of the way exceeding a mile a minute. They were overtaken at last by an engine, which coupled on and hauled them back.

USEFUL INFORMATION.

To Make Koumiss.

Koumiss is considered a good restorative, and is undoubtedly a help to digestion. It can be made by any one. The following directions for making it are from the *Weekly Medical Review*:

Fill a quart champagne bottle up to the neck with pure milk; add two tablespoonfuls of white sugar, after dissolving the same in a little water over a hot fire; add also a quarter of a two-cent cake of compressed yeast. Then tie the cork on the bottle securely, and shake the mixture well; place it in a room of the temperature of 50° to 95° Fahrenheit for six hours, and finally in the ice-box over night. Drink in such quantities as the stomach may require. It will be well to observe several important injunctions in preparing the koumiss, and they are: To be sure that the milk is pure; that the bottle is sound; that the yeast is fresh; to open the mixture in the morning with great care, on account of its effervescent properties; not to drink it at all if there is any curdle or thickening part, resembling cheese, as this indicates that the fermentation has been prolonged beyond the proper time. Make it as you need to use it. The virtue of koumiss is that it refreshes and stimulates, with no after reaction from its effects. It is often almost impossible to obtain good, fresh koumiss, especially away from large towns. The above makes it possible for any physician to prescribe it.

ANT EXTERMINATORS.—A correspondent of the *Call* recommends the following as effective: Take a large, coarse sponge, saturate it with warm water and press it dry, then sprinkle it over with fine pulverized sugar and place it where the ants are troublesome. They will soon collect upon the sponge and get into the cells. Then dip the sponge into scalding water, which will kill them. Wash out the sponge, and repeat the process. By this means you will soon be entirely rid of them. Another correspondent suggests this: Corrosive sublimate applied with a feather to the edge of pantry shelves and along the edge of the floor will be found an effectual "ant exterminator." More than one application may be necessary at first, but the ants will surely disappear after it has been thoroughly used. Corrosive sublimate is a deadly poison and must be used with care.

A NOVEL LIGHT.—Take an oblong vial of the clearest and whitest glass, and put into it a piece of phosphorus about the size of a pea. Pour some olive oil, heated to the boiling point, upon the phosphorus, fill the vial about one-third full and then cork it tightly. To use the novel light remove the cork, allow the air to enter the vial and then recork it. This empty space in the vial will become luminous, and the light obtained is equal to that of a lamp. When the light becomes dim its power can be increased by taking out the cork and allowing a fresh supply of air to enter the vial.

A CURVING RANGE OF BALL.—A correspondent of the *Scientific American* asks: Admitting the fact that a base ball can be made to curve by causing it to take a revolving motion, why does not a rifle ball curve, shot out of a grooved barrel? That journal answers as follows: "All round balls shot from rifled guns do curve to the right or left, according as they revolve to the right or left. But elongated balls or bolts of a length of 2 or 3 diameters are now principally used with rifled guns, and these projectiles go straight."

BLOOD FOR CATTLE.—The use of blood as a food for cattle has, it is stated, been the subject of experiment in Denmark by a chemist, who, as a result, has now invented and patented a new kind of cake in which blood forms one of the chief ingredients. This new food is stated to be exceedingly nutritious and wholesome, and is eaten with avidity by all sorts of animals, and even by cows and horses, which have naturally a strong dislike to the smell of blood.

CATS AT HIGH ALTITUDES.—It is stated as a fact that there are no cats in Leadville. Hundreds of these animals have been brought there, of all kinds and species, but it is said none ever lived more than two weeks. But then there are neither rats nor mice in the place, so that the absence of cats works no injury. The thin atmosphere at the altitude of over 10,000 feet is believed to be fatal to these vermin as to their natural foe, the cat.

INODOROUS PETROLEUM.—A new departure in the petroleum oil business is spoken of as being nearly ready for introduction to the public. It is asserted that perfectly sweet oils are being produced, without odor or unpleasant taste, which will be largely used for medicinal purposes, as tonics, etc. We understand that the experiments have been entirely satisfactory, and that preparations for producing this oil in large quantities are nearly completed.

A CURIOUS BOOK.—The most curious book in the world is one that is neither written nor printed. Every letter of the text is cut into the leaf, and, as the alternate leaves are of blue paper, it is as easily read as the best print.

WATER VS. LAND TRAVEL.—People may now go faster from one distant point to another over the water than over the land. The New York *Sun* says: "If there were a straight stretch of water from New York to San Francisco, there is no train on the present schedule between the the two points which the *Oregon* would not leave behind her."

APPLES vary considerably in weight, different varieties weighing from forty to forty-nine pounds to the bushel. A bushel of Baldwins is said to weigh forty-eight pounds. A bushel of large apples, it is said, will weigh more than a bushel of small ones.

LONG LOAVES.—The bread eaten at the table in Turin, Italy, is a yard long and an eighth of inch in diameter, of a pipe-stem form, very crisp and exceedingly palatable. It is called "grissial," after the doctor who invented it on hygienic principles.

BRONZE CASTING in New York has become an extensive business, and the works of art of Europe are reproduced by Guerin and others as finely as they can be made in Munich or Paris. We formerly sent statues to Europe to be cast.

A NEW kind of cloth is being made in Lyons from the down of hens, ducks and geese. Seven hundred and fifty grains of feathers make one square meter of a light and very warm waterproof cloth, which can be dyed in all shades.

HOLLOW AND SOLID SHAFTS.—It takes twice as much power to turn a four-inch shaft 100 times a minute, as it does a two-inch shaft, even allowing both to be of the same weight, which is done by making the large shaft hollow.

GIVE THE FLIES A CHANCE.—In putting up your screen doors and windows, be very particular to have a little hole in one corner so that the flies can go outdoors when they get tired of being inside.

FROM NEW YORK TO BOSTON.—The project has been revived of building a railroad between New York and Boston. It is estimated that the needful double-track road can be built for $25,000,000.

GOOD HEALTH.

Is Death Painful?

Dr. G. L. Bardsley, in the *Medical and Surgical Reporter*, concludes that the dread of dying is quite as intense as the instinct of self-preservation. Indeed, it is not improbable, adds the doctor, that numbers would care less about living were the modes of leaving the world a theme for happy contemplation, or an innovation to the routine of plodding that was agreeable. One is remarkably exempt from the crime of hasty induction, if he affirms that there is no sane or healthy mortal who anticipates his extinction with any degree of pleasure.

The function of dying is absolutely vegetative—we fall to pieces like a flower. This very fact, that the process is chemical, confirms us in the conclusion that the final "throe" is as painless as the inconvenience is nothing to the fetal pilgrim when he touches on daylight. A moment's examination of the way we are to die will show marks of goodness in our "taking off." The degree of sensibility is proportioned to the integrity of the tissues. An inflammation hightens it; age depreciates it. Any defect in nutrition disturbes the comfort of the individual until the carbonic acid generated in the devitalization of the blood becomes fixed in the cells or is no longer displaced. The sensory ganglia everywhere part with their irritability by virtue of this poison, and cease to conduct currents. The criteria of death are being satisfied, and the process is consummated when this extinction of sensibility prevails at the ultimate filaments.

During the progress of this dissolution of the nerve force, this creeping on of the numbness of death, the individual is rapidly passing into a condition of repose, and instead of torture or pangs, a degree of self-satisfaction oft approaching to enthusiasm is realized. The sensations peculiar to the therapeutical operation of opium, hashish, ether, etc., are not improbably akin to the mental activities of the dying. Barring the hallucinations experienced in the stupor as it gains on the subject, the moribund is familiar with naught that borders on suffering. This carbonic acid has poisoned or narcotized the several ganglia, and reflex productions are interdicted. A consummate analgesia prevails. In short, the notion of pain is forbidden the instant that any stimulus fails to excite a response. The condition to this irritability is that the nerve center and track be sound. If this vigor vanishes, reflex phenomena are at an end, and suffering, physiologically speaking, is impossible, because of the arrest of the function of the sympathetic.

Fortunately, for a wholesome study of one's demise, there are assurances abundant, from vivisection, the testimony of those who have been restored to consciousness, and the affirmations of the dying, that there is no physical recoil from death. Burney tried hard to resist the efforts made to resuscitate him from drowning, so bewitched was he by his prolonged slumber. Dr. Solander, the traveler, was so delighted with the sensations of excessive cold, that he was the first to lie down in the snow to realize the luxury of such a death. Wm. Hunter was sorry he was not able to "write how easy and delightful it is to die." Infants die as serenely as they breathe, and not a few among the advanced in years treat death as a friend to their infirmities. Hanging is naturally rated, next to crucifixion, a most distressing procedure. But it is reported of those who have been saved from strangulation, that the agony promised to be brief, and was rapidly replaced by hallucinations of a fascinating variety.

One would fain believe that the kind God who suffered us to feel no sigh in coming, would take no delight in turning our farewell into writhing—nay, he does not quit us at the last. He is our greatest benefactor in allowing us to sleep out of weariness. Death is, assuredly, no tax collector; its "jaws" are not the clutches of an assailant; there is no "victory to the grave;" the ghost speeds away from us as it entered, with no ruffle. The sense of death, as Shakespeare has it, is most in apprehension. It is the fear of the lonely night, not the throes of nature, that makes the leaving painful.

TO THE SLEEPLESS—A REMEDY.—"Sanita" writes to the New York *Sun:* I hope that I may bring a little comfort to some of those who have tossed from one side of a hot bed to the other through these melting nights, vainly seeking for the sleep that would not come to their wearied frames. Those who have lived in India, China or Australia know the value of a "Manilla sheet," a thin mat of fine straw placed between the mattress and the lower sheet. The same thing is made in Central America by the native Indians and universally used, while in Cuba a great piece of leather is frequently put to the same service. These things are not always accessible here. I know of several of my friends who have lately searched the Chinese and Japanese shops of New York for Manilla sheets, only to be told "We have had them, but are quite out of the article at present." But necessity is the mother of invention, and I think it was a positive inspiration that last week suggested the use of a long piece of the ordinary Chinese matting. An invalid of my family had passed the long, weary, sleepless nights, rising unrefreshed after a hot night of unrest. I ordered his mattress to be covered with a long strip of the common red and white matting, which during the summer had taken the place of a rug in my own room. Since then he never fails each morning to express his satisfaction and comfort. This is so simple and cheap a remedy that I hope some of your readers may be induced to give it a trial.

COFFEE AN AID TO DIGESTION.—Drinkers of coffee will be glad to learn the results of the experiments as to its action on the composition of the blood and the digestive functions, undertaken by three French savants, M. M. Couty, Guimaraes and Niobey. From their experiments the authors conclude that coffee acts beneficially in stimulating the consumption and digestion of the nitrogenous elements in the food. They have communicated the details of their observations to the Paris Academie de Sciences. —*Exchange.*

This paragraph is going the rounds of the press—as being something new. Nearly 300 years ago Lord Bacon wrote: "They have in Turkey a drink called coffee. This drink comforteth the brain and heart and helpeth digestion." The fact is well established that coffee, properly prepared, and taken in the right quantity, acts beneficially upon the system and is peculiarly grateful at the close of a hearty dinner. Where it fails to agree with a person, however, it is generally due to some peculiarity of constitution or habit. We find people who cannot drink milk without trouble; others are made sick by eating fresh oysters, scallops, strawberries. These peculiarities are due to some derangement or natural weakness of the stomach, or freak of the palate. "Coffee from Plantation to Cup," is an entertaining and valuable practical treatise, which covers the entire ground. So much so that it is called by the press a cyclopedia on the article.

CHEESE AS FOOD.—In a lecture before the Society of Arts, London, Prof. Williams said that twenty pounds of cheese contained as much nutritious material as a sheep of sixty pounds, and would give the same value in practical nutriment if it could be as easily digested. The lecturer then demonstrated that the indigestibility in cheese was the loss of its potassium salts in the process of manufacture. Another savant present decided to experiment as to the feasibility of restoring the lost salts and making the article perfectly digestible. He is said to have succeeded so well that the matter will soon be tried on a large scale. The amount of bicarbonate of potash is one and a quarter ounces to one pound of cheese. The two are simply melted together over a slow fire, with a small quantity of milk.

MACKEREL AND ALE.—Notices have been posted outside the various metropolitan hospitals in London, warning the public against the excessive use of mackerel and mild ale at this season of the year, as the fish are liable to contain a small worm, which would be injurious and likely to cause cholera and other diseases. The caution, with regard to the drinking of large quantities of mild ale, is given especially to the working classes. The beverage produces profuse perspiration, and renders the body liable to a chill, which would be likely to lead to serious consequences.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

MAMMOTH.—Amador *Ledger*, Oct. 25: A quantity of the rich metal, carrying a large percentage of free gold and black metal which is mostly gold, has been taken out of the tunnel of the Mammoth mine this week. We were shown specimens of the ore last Tuesday. One piece weighing probably ten pounds, is estimated to contain in the neighborhood of $100 in gold. We have not heard the extent of this streak of free gold. It has been encountered in upraising from the tunnel. The mill has been kept running steadily for nearly three weeks, and everything looks well for a rich yield. About 30 men are employed at the mine and mill and big tunnel, a larger number than has been employed for a long time.

RICH.—Amador *Dispatch*, Oct. 25: Another body of fabulously rich rock was struck in the celebrated Nevills mine a few days ago. Some specimens of the rock were found to be nearly one half pure gold.

Mono.

THE STANDARD CON.—Bodie *Miner*, Oct. 27: During the week ending October 25th, we employed fifty-nine men. We extracted and shipped to the mill 528 tons of ore, and 700 tons of tailings. Received from the ore 604 ounces of crude bullion, and from the tailings 206 ounces. Have shipped the company this day one bar of bullion, valued at $9,218.27, of which $6,617.64 is from two weeks' run on ore, and $2,600.63 from two weeks' run on tailings. North drift from Upraise No. 2, 385 foot level, has been advanced 12 feet, and is in 39 feet. The vein is in three and one-half feet wide, of low grade ore. Upraise from South Drift No. 1 is up 52 feet, progress 13 feet, showing about 18 inches of vein. We are stoping from Upraise No. 1, south drift, 500 foot level.

STANDARD CON.—Bodie *Free Press*, Oct. 28: They have extracted and shipped to the mill 528 tons of ore and 700 tons of tailings. Receiving from the ore 604 ounces of crude bullion and from the tailings 206 ounces. Shipped to the company one bar of bullion valued at $9,218.27, of which $6,617.64 was from two weeks run on ore, and $2600,63 from two weeks run on tailings. North drift from upraise No. 2, 385 level, has been advanced 12 feet and is in 39 feet, the vein being three and a half feet wide of low grade ore. Upraise from south drift No. 1 is up 52 feet; progress 13 feet, showing about 18 inches of vein. They are stoping from upraise No. 1, south drift, 500 level.

BODIE CON.—During the past week 140 tons of tailings were worked at the mill, the average assay value of which is $6 per ton. They commenced crushing ore yesterday. At the mine the south drift, second incline level, is in 34 feet. The upraise, 500 level, is up 193 feet. The south drift above the 550 level, is in 82 feet. The west joint crosscut, 550 (Lent shaft) level, is in 31 feet. Forty men are employed.

MONO.—The winze below the 600 level is down 43 feet. The joint west crosscut, 550 (Lent shaft) level, is in 31 feet. There is no change to report in the mine. Eight men employed.

BULWER CON.—Upraise from south drift No. 3, 385 level, is up 122 feet; progress 13 feet, showing about 20 inches of vein.

Nevada.

REACHED THE LEDGE.—*Transcript*, Oct. 24: Wm. Avery of North Bloomfield, who recently bonded from A. Lademan the Federal Loan mine on Deer creek, has finished cleaning out the old works and reached the ledge. He will soon have out a crushing of ore.

THE BANK OF TAILINGS.—Virginia *Chronicle*, Oct. 22: The large bank of tailings on Six-mile Canyon creek, over the Carson river, is estimated to contain at least 500,000 tons. These tailings are owned by J. M. Douglas of this city, and were saved up by turning the water of Six-mile Canyon creek into immense reservoirs. As fast as these filled up and settled, the tailings were shoveled into a pile and the creek turned again into each empty reservoir. This process was carried on for years, while the mills on the Comstock and in the Six-mile Canyon were crushing ore and working tailings, the water of the creek being then heavily charged with sulphurets. The tailings thus accumulated are said to average nearly $8 per ton. About four years ago Mr. Douglas purchased the large mill in Dayton of the Lyon Mill and Mining Company, and built a narrow-gauge railway, six miles in length, from the mill to the reservoir. An eight ton locomotive, called the "Joe Douglas," now hauls the tailings to the mill, which handles 140 tons per day, with a force of ten Chinamen (at $1.25 per day), and about five white men. The mill is run by water power. Although running for three years on these tailings, it will take at least seven years more before the material is all disposed of. When turned into bullion it is calculated that it will net the round sum of $4,000,000. In connection with the pan-mill there are several batteries containing twenty stamps, and likewise an acid and bluestone factory. Although the mill is in Dayton, the tailings and the bullion resulting therefrom all come from the Comstock mines.

San Bernardino.

BONANZA KING.—Supt's. Letter, Oct. 24: The northwest drift on the seventh level is in a favorable change of formation, giving indications that we are in the neighborhood of another vein. The new development in the east cross-cut, fifth level, continues to improve. The ore mined from this vein gives assay returns of $597 per ton. The north drift next to the west wall on the fifth has cut through the vein. The ore appears to make above the present drift. The south winze from the fifth level is 20 feet deep. The west wall has made into the winze, and the ore body has been correspondingly set off to the east, but appears to be the most extensive body of ore we have had in this section of the mine. Development work is being pushed forward.

Sierra.

WORK PROGRESSING.—*Mountain Messenger*, Oct. 25: J. Higgins, of Nevada City, is putting up an 8-stamp quartz mill, to be run with a Pelton wheel, on the quartz ledge of Jerome York, up Slug canyon, for Cross & Simonds. Grading is now in progress for the mill site, and a trail being made, via Mt. Vernon, to Downieville. Two batteries have been purchased of the Mt. Hope Co., and Forbes & Taylor have the contract for the machinery.

Siskiyou.

THE B. B. MINE SOLD.—Yreka *Union*, Oct. 25: A newly organized company, of which Lieutenant-Governor John Daggett is president, has bought the Black Bear quartz mine, together with the mill and all appurtenances. Little work will be done this winter, but in the spring it will be operated upon a more extensive scale. Mr. J. B. Little has been retained as superintendent. Mr. Daggett, with his usual enterprise and excellent judgment, will certainly bring the mine to the front and revive the good old times, such as existed a few years ago in that section.

Trinity.

ATTRACTING ATTENTION.—Trinity *Journal*, Oct. 25: The extraordinary richness of the quartz ledges on East Fork in this county is atracting the attention of mining men all over this coast. Several have already been here investigating and pronounce the district simply wonderful. On Friday, Mr. J. Sutherlin and Mr. Leitman, both experienced quartz miners, passed through town on their way to East Fork.

Tuolumne.

GOOD ROCK.—*Union Democrat*, Oct. 25: Some very good rock is being extracted from the Dead Horse mine at Summerville. Arrangements have been made to have 100 tons or so crushed at Easton's mill by way of making a working test. Should the result prove satisfactory the Dead Horse owners will probably build a mill of their own.

NEVADA.

Washoe District.

OPHIR—Virginia *Enterprise*, Oct. 25: Some ore is still being obtained on the 250 level. The drill-hole from the face of the drift on the 500 level is drawing off the water very rapidly. The level will probably be quite dry by the time the drift reaches it. Work is not now being done in the face of the drift, as it has been found necessary to timber it up at certain points. On the 1500 level the south drift is being sent ahead at the rate of 60 ft a week.

HALE AND NORCROSS.—The winze below the 2800 level is down a little over 140 ft. At the 2900 level—which is at a depth of 123 ft on the slope of the winze—a working station is being cut out. Nothing is now doing on the 2800 level. The sump at the Combination shaft has been completed and a working station is being cut out at the 3000 level. The repairs to the station on the 2400 level at the top of the main winze have been completed. During last week the Eureka mill, Carson river, was stopped for repairs and but about 80 tons of ore were shipped.

ALTA.—Steady progress is being made in the east drift on the 2150 level. It will yet be about eight days before the vein is reached. Progress is slow for the reason that the ground is quite wet and as the vein is approached pockets are encountered that contain a great deal of water, and nothing can be done until the water has run out. The pump is usually kept running at six strokes per minute, but when pockets of water are found it is necessary to increase the speed to seven or eight strokes for some hours.

BEST AND BELCHER.—Work on the 2500 level has been suspended—except pumping—the whole mining force being concentrated upon work near the surface. At the 825 level the north drift has reached the south line of the Con. Virginia, and the work of running cross-cuts will be commenced on Monday. The ground passed through in the drift is of a very favorable character, and the indications are good for finding ore to the westward when cross-cuts are run in that direction.

BENTON.—The drift on the 2160 level is being pushed forward as fast as can be done without bringing out to much water. It will be yet about eight days before the vein is reached. The water is handled with the pumps running about six strokes a minute on an average, though occasionally it is found necessary to increase the speed to eight strokes for a few hours.

MEXICAN.—The station at the 3300 level of the joint Ophir, Sierra Nevada and Union Con. winze is completed. From this station a drill-hole has been started west. This drill-hole was yesterday out 250 ft. The ground is perfectly dry, and the material about the same as at the bottom of the winze.

GOULD AND CURRY.—The main south drift on the 825 level will reach the north line of the Savage next Monday, when the work of running cross-cuts will be commenced. On the 2500 level nothing is being done except pumping operations being now concentrated upon the 825 level.

SAVAGE.—The E street tunnel is being advanced at the rate of 40 ft per week. It is in ground of a favorable appearance. Repairs to the station on the 2400 level at the head of the joint Hale and Norcross winze are completed.

COMBINATION SHAFT.—A sump 50 ft in depth has been completed and a working station is now being cut out at the 3000 level. At this point will also be cut out a station for the new hydraulic pump.

UTAH.—Very good progress is making in the southeast drift on the 1950 level. The rock is vein porphyry with seams of quartz and streaks of clay. It is in ground heretofore wholly unexplored.

ANDES.—The west cross-cut shows a mixture of quartz and porphyry. In the north drift there is little change. Some low-grade ore is being extracted for milling.

OVERMAN.—The usual amount of low-grade ore is being extracted on the 226 or Petaluma street tunnel. The ore taken out is being worked at the Vivian mill.

CON. VIRGINIA AND CALIFORNIA.—On the 1750 level rapid progress is making in the northwest drift. Extensive explorations will presently be made at this point.

ALPHA.—On the 900 level they are now about to the point where it is expected to reach the large deposits of quartz found at points above.

SCORPION.—The main north drift continues in vein porphyry which shows occasionally seams of clay and stringers of quartz.

BELCHER.—Sufficient ore is being extracted on the old upper levels to keep the mills on the Carson river in operation.

CROWN POINT.—About the usual amount of low-grade ore is being extracted and sent to the mills.

YELLOW JACKET.—About the usual amount of ore is being extracted from the old upper levels.

Belmont District.

BELMONT.—*Courier*, Oct. 26: We visited the Belmont mine on Sunday last and were surprised to find so much rich ore in sight. The south portion of the mine is improving as the work of development progresses. About 30 ft below the 200 level south, they have encountered a body of rich rock. The ore carries black metal, chloride and native silver in good quantities. The head of the drift showed the same quality of ore and the ledge widens as they advance on it.

Bernice District.

LOOKING LIVELY.—Cor. New State *Journal*, Oct. 25: All the works in the mines are looking finely and plenty of ore. The main tunnel was run some 60 ft last month; the face shows good ore. The lower tunnel was run 30 ft, showing a good vein of ore, 14 inches wide; upraises 5 and 6 have fine ore assaying up in the hundreds. Mr. Ramsdhor is working the ore up to 92 per cent. Mr. Williams is well satisfied with Mr. Ramsdhor's management in the mill and thinks he has got the best mill man in the State. Last month the mill run only 18 days; the pulley on the cam shaft broke and could not be replaced short of Austin. The result of the 18 days run was $7,125. Supt. Williams is well pleased with his prospects, and is now settled beyond a doubt that he will make a thriving camp of this place and be well paid for the time and money he has invested in this new enterprise.

Bruneau District.

IMPORTANT MINING STRIKE.—Tuscarora *Times-Review*, Oct. 21: An important strike is reported in the Lady Anna mine at Bruneau. The claim was formerly known as the Young America and has been abandoned for a number of years, when a few experienced and preserving miners, noticing the favorable indications, relocated it and sank upon the ledge to the depth of 32 ft. The inclined commenced on a true fissure vein 18 inches in width, carrying 6 inches of ore composed of oxide and sulphide of copper and silver bearing antimony with silver sulphide. There was also a vein of sulphuret ore connecting with the foot wall. The decline is upon an angle of 50 degrees, and at the botton the ledge measures 4 ft in width, having gradually widened from the surface and carrying ore the entire distance that ranged in quality from $100 to $1,200 per ton, the assays averaging $545.34, of which $521.03 was silver and $24.31 gold. The ore in appearance is similar to that found in the Infidel mine at Columbia. Having plenty of ore in sight the company is confident of shipping several car-loads in the spring for reduction. Before doing this, however, it will be necessary to build 6 miles of road through the mountains to enable transit from the mine. The property lies about 90 miles easterly from Tuscarora and within 10 miles of the Idaho line. It is situated between lofty mountains on the east and west near the Bruneau river, on the banks of which is an abundance of timber for fuel. There is every facility in the vicinity for the economical working of the mine and the reduction of ore. The ledge can be traced on the surface for a long distance and rich ore has been found close to the grass roots for a distance of 3000 ft. The property is owned by T. H. Watkins, C. A. Watkins, G. S. Watkins, C. M. Moore and A. Leichter, who not having the means to build tha road, have concluded to incorporate the mine and sell a few thousand shares for a working capital. They will sell a limited amount of stock at very low figures, with the stipulation that every dollar shall be devoted to the building of the road, and the development of the property. Some specimens of the ore are now on exhibition at the express office in this town.

Esmeralda District.

GOOD NEWS.—Esmeralda *Free Press*, Oct. 26: The Silver Lining mine at Aurora, formerly owned by Ex-Governor Blaisdel and San Francisco parties, has changed hands. Messrs. Holt and Colcord become owners in the property. Particulars of the transaction have not been ascertained.

Granite District.

GOLD MINING.—Eureka *Sentinel*, Oct. 26: Fred Gotchet, accompanied by William Kierson, who has been working for him in the mine, came into Eureka Saturday from White Pine, bringing in 10 pounds of gold. At $17 an ounce this gives him a clean-up of about $2,000. His mine, the Oro, is located in Granite district, about 22 miles from Cherry creek. The property has not been explored to any considerable depth. The vein, which is nearly horizontal for some distance, pitches down afterwards, but it has not been followed on the pitch. Some specimens brought in show an abundance of free gold in brownish iron-stained quartz. The rock taken out so far has averaged between $60 and $70 a ton, though some of it, in nuggety specimens, runs up into the thousands. Mr. Gotchet works his mine during the summer and reduces the ore in a water mill with four batteries. In the winter the water freezes up and he has to wait for the return of spring. George Cjutson owns the extension of the Oro, which he calls the Summit. It looks as though these gentlemen own a handsome property that bids fair to make them rich. Mr. Gotchet tells us that the expense of working his gold quartz is almost nothing. Outside of the cost of grub and extraction (the latter being slight as the ore is taken from a tunnel run into the ledge) the whole expense of getting out his last shipment of $2,000 was only $150.

Mineral Hill District.

DULL.—Cor. Eureka *Sentinel*, Oct. 25: At the present time but few men are employed at the mines and but just enough at the mill to keep it running, which it is doing, and turning out the usual amount of bullion, as shown by the "clean-up" every 30 days. A transfer of the mill and principal mines may occur about the first of November; if not, it is proposed to keep the mill running all winter on tailings, if the weather will permit.

Paradise District.

ANOTHER DIVIDEND.—*Silver State*, Oct. 25: The Paradise Valley Mining Company have declared another dividend of ten cents per share, payable on the 29th instant. This is the fifth dividend declared by the company since Superintendent McCurdy assumed charge of the mine. Were it not for the ruinous discount on silver bullion, the Paradise valley company would have been enabled to declare four more dividends within the last year. All who desire to see Nevada prosperous, and who are directly or indirectly interested in silver mining, should remember the friends of silver on election day.

Pine Grove District.

PICKING UP.—Virginia *Enterprise*: This little mining camp Esmeralda county is again picking up, and there is liable to be quite a sized boom there. The Robinson boys are now taking out some very rich gold ore from the Wilson mine. The rock is being worked at the Wilson mill, and is very rich. The work is being done by contract, and about ten men are at work in the mine. All the mines in this district are looking much better than for years past.

Rebel Creek District.

A HEAVY DISCOUNT.—*Silver State*, Oct. 21: Frank Snapp sent a carload of ore from the Ohio mine in Rebel creek district to Salt Lake to be reduced. He received the returns from the ore a few days ago, and they show the discount to be $962. Think of that miners, farmers, and in short everybody who desires to see the great industry of our State placed on something like the same level with the products and manufactures of the East. Silver miners as well as iron miners and coal miners and manufactures should have fair play.

Tuscarora District.

NAVAJO.—Supt's Letter, Oct. 24: South drift on the 250 level continues in ore. Total distance south of north line 565 feet. Stopes on this level are looking well. On the east lateral vein the south upraise has connected with the intermediate drifts. South drift from No. 3 crosscut, 150 level has been advanced 18 feet. North drift from same extended 27 feet. The vein shows some improvement at both points. Upraise north of No. 2 crosscut has been carried up 32 feet in high grade ore. Upraise south of No. 2 cross-cut, shows a width of four feet wide, a few inches of it, solid horn silver. The usual grade and quantity of ore has been milled the past week.

ARIZONA.

STRIKE IN COPPER.—Tombstone *Epitaph*, Oct. 21: Mr. John Prout, superintendent of the Atlanta mine at Bisbee, is in the city. He reports a strike in the mine in the main shaft at a depth of about 200 ft. Also that a shaft dropped right into a drift which had been run from the Copper Queen mine into the Atlanta.

SILVER.—Prescott *Courier*, Oct. 21: J. M. Wilson, the assayer, has specimens of rich silver ore from the Alter mine, Hassayampa district. The ore carries silver in native form. The vein is 20 ft thick. Assays range from $130 to $1,000 per ton. Mr. Scott of Saulsbury & Co., miners, arrived in town recently on his way to Wickenburg, where his company have several concentrators taking gold out of old Vulture tailings. Mr. Scott reports miners doing well in Mohave county.

THE UNITED VERDE.—Arizona *Miner*, Oct. 20: Governor Tritle, who returned yesterday from Jerome, states that the mines of the United Verde continue to improve with depth, the ore bodies continuing to increase in extent and richness. The foundation for the new smelter has been completed, and the work of erecting it will be commenced immediately on the arrival of the machinery, which is on the road to the mine from Ash Fork. It is thought that the furnace will be ready for operation within six weeks. The Governor anticipates that no necessity will arise for the closing down of the mines during the present winter on account of scarcity of coke and other supplies, as such a possible contingency has been prevented by the preparations made during the summer. Should the price of copper continue to decline until the market price is less than eleven cents, the company will cease to ship bullion, preferring to await a revival in the market than to "gutting" their mines.

NOTES.—Prescott *Courier*: John Hutchins, of Groom Creek district, has brought in very rich pieces of ore from the Nevada and other mines. W. D. Chambers, of Walker district, was here Saturday last and stated that placer miners are making fair wages. Not much quartz mining going on in the district. Machinery for the quartz mill that is going to be set up in Big Bug district was landed there Saturday last. Cox & Craigue continue to ship ore from the Dosoris and Buzzard mines. Lane mine is furnishing plenty of ore for the Tuscumbia mill.

THE QUIJOTOA MINES.—The latest report of Superintendent Smith is as follows: All work is going ahead as usual. Peerless tunnel, No. 1, is in 324 feet. At a distance of 312 feet, we cut a well-defined foot wall dipping to the west at an angle of 68 degrees. The material passed through up to the present time looks very favorable, showing some very good streaks and bunches of ore, and of a very much softer nature than any place where the vein has been cut heretofore. The north lateral drift being driven on the vein from Crocker tunnel No. 4, is in 66 feet; assays from the face to-day, $9,100. The general appearance is much more favorable as we go north. The winze from the south drift in the main tunnel is down 12 feet, and shows quite an improvement since last report, and will, in my judgment, improve in depth. Sinking of the winze on the top of the hill is being shoved ahead as fast as possible. One upraise will be started from tunnel No. 1 at once, in order to make connection, which will facilitate our work very much. A portion of the machinery for the air compressor is on the ground. Mr. Patton will be here on Monday to superintend the construction of the same, and when completed and in operation work will be advanced much more rapidly and additional work started.

COLORADO.

GUNNISON COUNTY.—Gothic *Record*, Oct. 21: Jake Gookwin has a 30 ft contract on the Ben Franklin. The Jim Bedford mine, in Rustler gulch, is turning out a large amount of gray copper. The brothers O. and E. Coy, heavy owners in coal and silver mines on Rock creek, started for their Kansas home on Wednesday. The Niagara, on Avery mountain, is being developed by a 50-ft shaft. It is

now in a large body of quartz, apparently carrying a good quantity of sulphurets. A mill run will soon be had. George T. Challis, mining operator and general speculator, has returned to Atchison, Kansas, where he will work up a scheme for running a tunnel through Sheep mountain—a project, by the way, that would insure a fortune to its projectors, and do a great deal to develop and advance the interests of the camp. Colonel Willett Rose, of the Crested Butte sampler, says he will pay for dry ores the same prices offered by Moffet at Gunnison, and that for lead ores he will pay better prices. Mr. Gellett, of the Augusta mine, tried the Moffet smelter, but is again patronizing the Crested Butte sampler. Work on the Finlayson and Oliver group of mines in Maroon basin has developed an 18-inch streak of nearly pure glance and gray copper, at a depth of 52 ft. In the Durango, the Sunset and Parallel, there is a good deal of the same character of mineral. William Gant and S. Harper have commenced shipping ore from the Hawkeye, one of their claims in Poverty gulch. Their first ton ran 172 ounces of silver per ton; the second over 200 ounces. They have 5 tons more already sacked, and are now packing it down. The ore is a heavy galena, and they have a large amount of the same kind in sight. The buildings and all the outside work at the Sylvanite mine are about completed. The force in the mine has been increased and everything will soon be on a winter basis. The air shaft has been raised about 40 ft, all in good ore. The little drift is making good progress in very rich mineral. The stopes are yielding abundance of the same material that enables Gunnison county to capture the gold medal at the Denver Exposition.

THE SANTA CLARA MILL.—*Tribune-Republican*, Oct. 21: The Santa Clara mill is running like a charm under the direction of E. P. Suydam and H. L. Scott, with Matt Lynch and E. B. Quigley as amalgamators. On last Thursday the first silver brick was turned out and weighed 61 pounds. On Wednesday three barrels were put to work for the first time. The crushed ore is stored in six boxes holding eight tons each, from which it is shoveled into the hoppers which feed the barrels. All slimes which often in wet crushing carry off chlorides and sulphurets, are now run into a tank and pumped to the battery feed tank so that nothing leaves the mill without first going through the amalgamating barrels. The ore being treated is from the Puzzle Extension and its value is over 100 ounces per ton, and on Thursday they commenced receiving ore of a higher grade. In the process the ore is drawn off into the separator, reduced to a liquid metallic state and collected in a basin somewhat similar to the lead well of a smelter. It is then strained through canvas bags and the hard amalgam is retorted and melted. After retorting, the silver is left in a spongy mass, which is then melted and run into bricks or bars.

DOLORES COUNTY.—*Rico News*, Oct. 21: The Taylors struck the vein in the Honduras yesterday. Steele Brothers have made an arrangement with N. J. Bradley and they will operate together on the Bourdon this winter. W. K. Patrick will next week commence work on the Up and Up lode, which adjoins the end lines of Frank Mogenson's famous Silver Belle on Yellow mountain. Work on the Golden Age will commence next week. An assay on the mineral made to-day gave 266 ounces. The C. H. C. vein has greatly widened under recent developments and is now over 6 ft in width. Mr. Carpenter says he could take out $20,000 worth of ore in one week if he felt so disposed. The Gold King M. Co., over in Gold King basin, has just sent an order to Denver for 4 Triumph concentrators. The Telegraph on Dolores mountain, a patented claim owned by A. H. Steele, W. B. Whiteside and W. E. Parsons, is being worked. The tunnel is now in 185 ft, and shows a vein of 4 to 5 ft, from which best results have been 140 ounces. John Eder, one of the owners of the Garibaldi mine at Trout lake, took up a lot of sacks this week and will send them down filled with ore. The Garibaldi was leesed this year with other properties to Fred. W. Reed, who abandoned work on account of water. H. E. Snyder is the principal owner in a group of claims 1½ miles above the Puzzle extension, comprising the Heavy Spar, Badger, Mountain Cross, Martha J. and Glass-Eyed Charley. The Spar has lately received some developments, and will be worked again soon. The best results from it are 56 ounces in silver. The Martha J. shows a big vein, but average results have not been above 10 ounces.

IDAHO.

CŒUR D'ALENE NOTES.—*Inter-Mountain*, Oct. 21: J. M. G. Hall arrived in Butte yesterday from Murray, Idaho. He says the almost constant rains that have fallen during the September and October have so swollen Pritchard creek as to render it necessary for most of the mines to close operations in the main gulch, though the owners of the Widow claim took out from rim rock in the last six weeks clean-up about $3,600. The men who leased the Pacific claim, in Murry, from John Downs, commenced sluicing last Sunday at noon, and on Monday evening they cleaned up nine and one-half ounces. Many have left the Cœur d'Alene diggings for the winter. The camp is dull, but those remaining are preparing good houses for winter quarters.

MONTANA.

PHILIPSBURG.—Cor. *Inter Mountain*, Oct. 21: Sunday I drove up to the Granite mine. Just this side of the Granite is the James G. Blaine. From the bottom of the 50 ft shaft a cross-cut has been run 60 ft and it is expected to strike the vein in a very short distance. Of the vein I could learn nothing, but from the fact that hoisting and pumping machinery are at Drummond and material is on the ground for the erection of extensive works, it would be inferred the mine is a good one. The Granite mine is one of the richest in this or any other district in Montana. This is the mine, it will be remembered, which cleaned up over $300,000 last summer on a run of 1500 tons of ore. There are at present 125 men employed by the company in the mine and on the construction of the new 20-stamp mill, but when the mill is finished it is expected to run the entire property with 50 or 60 men. The mill has one drying furnace, one chloridizer, six pans, three settlers, and two amalgamating pans. A corliss engine will furnish the power for the plant. Less than four months ago there had not been a pick struck in the ground nor a brick moulded for the present mill which is expected to be running regularly by the 15th of November. No expense has been spared by the company in the erection of their mill. The machinery is being placed under the supervision of Mr. Mackay, of Chicago, who is a most proficient gentlemen in every respect. The property is under the supervision of Mr. F. L. Perkins. Burleigh air drill are used altogether in the mine which is at present opened up by nearly 4,000 ft of tunnel and everything is in the best of shape for a long run when once the mill is started. Since the 1st day of June $150,000 has been spent in improvements by the company, including the grade to the property which cost $12,000. Money enough has been realized from the mine to pay its first cost and the cost of all improvements, thereby standing the company not a dollar out, and ahead one of the most valuable properties in Montana. There are now 400 tons of ore on the dump, averaging 100 ounces to the ton.

MEDHURST.—Cor. *Inter-Mountain*, Oct. 21: Another big strike has been recently made near this camp. A few days ago some rich ore was brought to town by Dick Prince and Charles Schott, from the Eureka mine, situated at the head of Princeton gulch, two miles and a half from Medhurst. From assays taken it is found that 18 inches of the three-ft vein goes 400 ounces in silver and $60 in gold, the other foot and a half averaging 100 ounces in silver. The shaft on this property has now attained a depth of 48 ft, from the bottom of which the ore was taken which produced the above assays. The lucky owners of this new property are R. Conn, Dick Prince, Charles Schott and W. P. Edwards.

The Princeton two-compartment shaft is 156 ft deep. From the bottom of the shaft a force of men are cross-cutting to the ledge. A drift is being pushed west from the station on a spur of the main ledge, from which some very good ore is being taken. A No. 7 Knowles station pump and a No. 5 sinking pump are used in the mine, which will be sufficient to keep the water out for several hundred feet deeper. The company have recently enlarged their building sufficiently to admit of another boiler being put in, which will be placed and ready to help in the good work in a few days. Twenty-five men are now employed in the mine, and if everything continues favorable, a large force will probably be put on in the spring.

IMPORTANT COAL DISCOVERY.—Avant *Courier*, Oct. 20: Scarcely a week passes without making new and important developments in Gallatin county coal interests. The latest is the important coal discovery of Sy Mountz & Co., on Trail creek, about a mile and a half below the Mountain House. They have tunneled into the side of the mountain about 80 ft, on the south side of the creek mentioned, and have developed two veins in close proximity—one of five and the other of seven feet. They are at least 100 ft deep on a perpendicular line from the surface, and have struck two of as fine, clean veins of bituminous coal, as has thus far been discovered in Gallatin county. They have brought several loads into town, all large, clean, solid coal, and they have a 400-pound specimen on exhibition in front of the Geyser saloon which speaks for itself. There is evidently a bright future to Gallatin county coal fields.

ORO FINO DISTRICT.—*New Northwest*, Oct. 24: There is a district, lying about midway between Butte and Deer Lodge, which is a field that offers great inducement to miners. This is the Oro Fino district. It has been "pegged away at" for a dozen years, just as Butte was, but nobody has yet systematically and thoroughly even prospected one of its numerous leads. There has been no Marcus Daly to pick out a spot and say: "We will prospect this lead to a depth of 300 ft and see if there are indications of a mine here." A few men have stayed by the camp for years, "representing," and some have put in a few hundred dollars "developing," but as yet no lead has been even fairly prospected. We mentioned a couple of weeks ago that Mills, Henneberry and others were sinking a shaft on the Champion. This week Mr. Mills brought down some rock taken from the bottom of the shaft and had it assayed. The result showed 1,114 ounces of silver per ton from sample pieces and from fine ore 306 ounces. The vein matter where this was taken out is 12 ft wide and no wall rock. The pay ore, of which the above were random pieces and decomposed rock, is 3 ft wide. Its richness was evidenced by roasting in the stove, which brought out the silver so thick it was decided to have an assay. The present week we learn that a number of prospectors have gone, or are going, into the district. The Champion is but one of a dozen or two leads that have been sunk on and showed up well. What the Oro Fino district wants is what Butte languished for—sufficient money under intelligent direction to develop it. There seems little doubt that it contains very valuable leads.

THE LITTLE ROCKY PLACERS.—Cor. Helena *Herald*, Oct. 21: The writer has been in the Little Rockies, and from a personal inspection ascertained that the mining field claimed by "Octavins" to be "the most extensive discovered in Montana for years," comprises a few narrow gulches in a detached range that a prospector can ride around almost in a day. Except People's creek, in which "grub diggings" have not yet been found, there is not more than 20 inches of water in any gulch there. Upwards of 20 experienced miners have returned in the past week, and all state emphatically that there is no gold there to amount to anything. A few claims in Little Alder and one or two in Little Rocky creek pays from $3 to $5 a day. Outside of these a man cannot make board. Having taken in the stampede to the Cœur d'Alene this spring, and having witnessed the misery that thousands endured there, led thither by the lying reports of interested individuals, I deem it a matter of duty to warn the public against this latest "wild stampede," which men of the "pound of flesh" type are trying to get up for their own selfish purposes.

NEW MEXICO.

NOTES.—Silver City *Enterprise*, Oct. 20: Old placer diggings have been discovered east of Pleasanton, in the Mogollons. The new district of Gold Hill is still the attraction for prospectors in this section. Most encouraging reports are being received from there. A good sized body of rich ore was recently struck in the Caribou mine, at Fleming. Jack McKee and Bart Downey have made a rich strike in Apache district. The vein is about 18 inches wide and averages 300 ounces. They have a carload of ore ready for shipment. The King mine, in Eureka district, has closed down. The main shaft which is 410 feet deep, contains about 200 feet of water. It will be turned into a stock company and work resumed in a short time. The Rob Roy mine, of the Penrose group, at Fleming, is showing up some fine ore. Favorable reports come in of the progress of development upon the Black Hawk mine. The characteristic rich ore for which the mine is noted, has been exposed in several openings during the past month. The new management appear satisfied with the amount of ore taken out since the first of August and intend prospecting with renewed energy during the present month. A force of men has been placed upon the Rose mine, at Bullard's Peak, and if they are allowed to work by the contending claimants, will take out ore that will surprise the natives. This claim is one of the richest surface locations ever discovered in New Mexico, but unfortunately has been in litigation since the discovery of rich mineral upon it nearly a year ago. The Silver Trumpet mine, in the Gold gulch district, owned by Messrs. Brown, Malone and Donohoe, is turning out some excellent grade ore, a car of which is on the dump, sacked and ready for shipment. An experimental test on Cooney ore was recently made by I. E. James, superintendent of the Carlisle mine, on the Duncan concentrators, with very satisfactory results. But a small quantity was treated at the time, and that was worked with a loss of but two per cent. When it will be remembered that assays running as high as five ounces in gold have been obtained from the Cooney mill tails, the result of the experiment will be appreciated. The prospecting of the Old Man vein during the past ten days has developed some fine ore. In the lowest point yet reached in the mine, mineral of an extra high grade is being taken out and the showing is better than at any exposure of mineral thus far made in the mine. The usual grade from the open-cut continues to be taken out. Four cars per month are being shipped to Pueblo for treatment. The discovery made on Big Dry creek, 11 miles east of Pleasanton, in the Mogollons, is said to be a most important one. Specimens of the ore have been sent to this office by R. F. Allered, one of the discoverers of the mineral. The ledge is said to be an immense one, from eight to twelve feet in width, and traceable for 9,000 feet. But two assays have thus far been made by Allered, and they have given the following results: $114 in gold and silver, and $78 in gold and silver. The discoverers, two of whom were grub-staked by Capt. M. Cooney, are confident that the camp will be a big one, as the vein is large and runs well. There has been a fine-grained galena ore discovered in the same camp.

ORGAN.—Rio Grande *Republican*, Oct. 24: Nothing going on at the Memphis excepting prospect work. A rich strike is reported in the north shaft. Work has stopped on the Gray Eagle, as the lease had expired, and there was talk of it being on the point of sale for a high figure. Dan McMillan has bonded the Ben Nevis for $8,000, and he has a force of men at work developing it. The shaft is down 40 ft, and the ore is black sulphurets in a vein said to be over five ft wide between syenite and porphyry. Mr. Henvis has struck a very pretty lead on the Buckeye claim, which, if it only continues, will be one of the finest in the district. He took out two lumps of ore to be shipped to New Orleans, one weighing 26½ pounds and the other 36¼ pounds. It is steel galena, carrying pyrites of copper; assay value, $60 to the ton. The shaft is down 20 ft. George Brown, of Clark and Brown, says they are both working on the Black Prince with a force of men, and the mine is coming out finely. They are down 80 ft, and although the claim was pockety at first, they have now struck a good vein of ore. The heavy rains have washed out a good part of the road they made to the mine, and it will take a week's hard work to put it into shape again. Work on the Jay Gould has been resumed and about 20 men are employed. There are also a few men at work on the Memphis, but we have no word as yet from Mr. Wessels. Col. Watts, on the east side, is working a few men on the Dallas and Way Up claims. D. McMillan and James Moran are on the Ben Nevis, Buoy, Rankin and Withrow on the Gray Eagle, Edwards and Thrower on the Montrose, Purdy and Hartzog on the Climax and many others are at work.

DISCIPLINE.—Silver City *Enterprise*, Oct. 21: The Old Man Mining Company has posted the following notice in Fleming: "All persons in the employ of the Old Man Mining Company are hereby notified that they will be discharged from further employment of said company whenever it becomes known to the officers of the company that they have been gambling at poker, faro, or any of the other games common to the camp; or for patronizing any dance hall or discharging any firearms between sundown and sunrise in Camp Fleming after this date."

OREGON.

THE CALUMET MINES.—*Mountain Sentinel*, Oct. 18: Work upon the property of the Calumet Mining Company has suspened for the season. A. J. Hopper, the superintendent, reports work up to within ten days, when the deep snows put a stop to further operations. Besides repairing a number of buildings that had been seriously damaged by snow-slides, and other improvements and alterations, a 17-foot open cut into one of the main ledges has disclosed additional evidence of the extent and richness of the property. Instead of following up the work commenced last season, it was deemed advisable to tunnel into the side of the mountain some 300 feet below the surface, where the immense body of rich croppings are in plain view, and tap the main edge at such a depth that it will prove beyond doubt the genuineness of the ledge and the richness of the ore. The tunnel is now into the mountain some 30 feet, and it is believed the main shaft will be arrived at in about 100 feet. Should the ledge at the point it will be tapped by the tunnel be as large and rich as it is above, the Calumet will no doubt be one of the most valuable mines on the coast. All the indications substantiate the belief of many experts, that it is a well-defined ledge, and not mere croppings. All the men that have been employed upon the work are satisfied that the claims held and worked by the Calumet Mining Company are in no distant future destined to be the scene of extensive and lucrative mining operations. Early in the spring active work will be commenced, the tunnel will be pushed to completion, and the mine will be opened up to the delight of stockholders, and demonstrate beyond a shadow of a doubt that there is "millions in it."

UTAH.

REVIEW.—Salt Lake *Tribune*, Oct. 25: The week has been rather quiet, a noticeable feature being the large amount and variety of ore receipts. For the week ending Saturday, Oct. 19th, inclusive, there were shipped out from Salt Lake City 46 cars of bullion, 32 cars of ore, and 14 cars of lead. During the week ending Oct. 22d, inclusive, there was received here from the mines, mills, and smelters, $111,016.44 in bullion, and $22,840 in ore; total, $134,756.44. For the week previous the receipts were $116,792.79 in bullion, and $10,800 in ore; a total of $127,592.79. The Horn Silver sent in 18 bars of bullion, valued at $54,000; total product this year to date, $2,067,000. The Ontario shipped during the week 38 bars of bullion, assaying $22,565.19; total shipments for the year to date, $1,374,306.48. The Silver Sandstones yielded during the week, from Silver Reef, 4 bars of Christy silver, assaying $7,341, and 2 bars of Stormont, $2,890. The product of the Hanauer smelter for the week was 10 bars of bullion, $19,075.

THE HORN SILVER.—Southern Utah *Times*, Oct. 21: The ore shipment from this camp during the week has been up to the usual standard. The Horn Silver mine sent out about 13 cars daily. When it is remembered that this has been going on for years, a faint idea may be had of this immense ore body. There is more ore in sight now than when the present company was first organized, and as the vein widens out as depth is reached, the Horn Silver stock will soon become a permanent investment. The stock is now quoted at $6, and the dividends amount to $3 per share per annum. While all the spare money of the east cannot be put into one mine, there are mines adjoining the Horn Silver which can by a judicious outlay of a little money, be developed into dividend paying properties. The yield of the mine can be held up to its present output for at least a quarter of a century, and unless a ruinous change be made in the management, the company cannot miss a dividend in all that time. With this fact before them, we would not be surprised to see the hillsides torn up by eager capitalists, who cannot rest satisfied that an ore body which makes the largest silver-lead mine in the world, can be confined within the stakes of one government location.

ALASKA.

GOLD PLACERS ON THE YUKON RIVER.—A dispatch from Victoria (B. C.), October 28th, says: The steamer Ancon arrived from Alaska this morning with about 225 passengers, and over 100 miners, from the different mines in Alaska and Cassiar. During the past season the miners have been very successful, all claims paying well, and, on an average, they would pan out about $10 per day to the man. Some have done very much better. At Juneau City there are about 300 miners, 150 of whom are employed by the company, who are working on the Paris lode, Douglas Island, of which Treadwell is manager. The Ancon brought news about the explorations of three prospectors on Stewart river and on the Yukon. They started from Chilcat, Alaska, in the Spring of 1882, and proceeded to the mouth of the Stewart river, up which they canoed for about 200 miles. Navigation was moderately easy on the Stewart river, there being stretches of 100 miles where portages had not to be made, and no portage is over half a mile in length. During their trip up they examined over 100 streams, in all of which they found gold in paying quantities. The ground was frozen in all places, there being a thick covering of moss through which the sunlight could not penetrate, and in spots this was five and six feet in depth. The beds of streams where water was running were found to be frozen solid. The prospectors report that, on account of the frozen nature of the soil, the dirt could not be operated. These men have been in these regions, which have been regarded all along as uninhabitable, for over two years in the Winter time, they going to the mouth of the Yukon by dog team for supplies, the distance traveled each way being nearly 1,500 miles. Two of the three remained at Juneau City, and the other is on his way to San Francisco to purchase a schooner and bring supplies by way of the Yukon to their claims on the Stewart river. This would indicate that their statement about the impossibility of operating the ground on account of frost is somewhat of a blind. They found places on the Stewart river where the Schiefflin brothers had been operating. During the two years that the party of three were in the interior, the lowest the thermometer registered was fifty-five degrees below zero.

MEXICO.

ORO BLANCO MINES.—Cor. Globe *Chronicle*, Oct. 25: We packed our burros in Globe City on the morning of the 20th of July, bid farewell to our friends and headed for the famous mines known as the Oro Blanco mines, situated in the State of Sinaloa. We arrived in Sinaloa on the morning of August 6th, making about 400 miles in 17 days, over one of the most rough and God-forsaken burro trails that it has been our misfortune to travel over. After leaving Arizona and entering Mexico the country looks a desert. On either side are stretches of sand, masses of barren rock and only semi-occasionally patches of vegetation. The dreary aspect continues from near the Arizona line through the States of Sonora, Chihuahua, Durango and Coahuila, and we arrived at Oro Blanco to find the same old story, famous for the many lies that have been said and written of them. Being 8,000 ft high, without a trail or pass that we could get a burro over, though by the aid of our pack ropes we managed to lower one another down cliffs and rocks for two days in trying to find the bonanza, though it was over in the other canyon. We are not very easy to please ourselves, so it is hard to say what does pay in this unsatisfactory world, but I would advise no one to make the same trip with the expectation of finding old California diggings—better look in Arizona. We find the country filled with an indolent and ignorant race. These, coupled with many other cognate facts, makes it but too evident that the existing Mexican mining mania is little more than a bubble and bound to burst some day.

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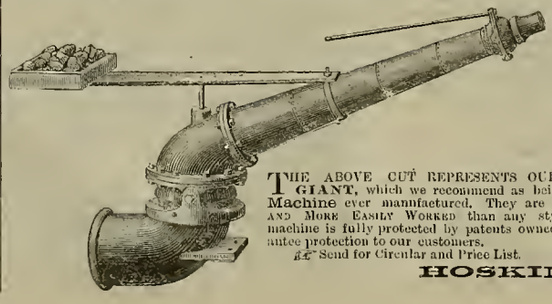

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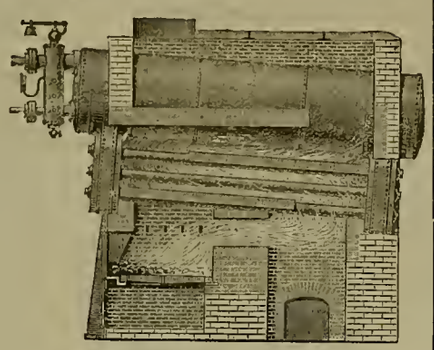

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Risdon Iron and Locomotive Works—Gentlemen: We have had one of your Heine Patent Safety Boilers in use for four months at our Borax Works, in Alameda. It does good work and gives perfect satisfaction. Yours truly,
(Signed) WM. T. COLEMAN & CO.

SAN FRANCISCO, Oct. 4, 1884.

Risdon Iron and Locomotive Works—Dear Sirs: I am using one of your Heine Patent Safety Boilers in my Candy Factory on Twenty-Third street, near Valencia. For economy of fuel, safety and efficiency I have never seen its equal. Very truly yours,
(Signed) W. S. TOWNSEND.

Send for Circular and Prices.

PERFECT PULLEYS

First Premium Awarded at Mechanics' Fair, 1884.

CLOT & MEESE,

Sole Licensed Manufacturers of the

Medart Patent Wrought Rim Pulley

For the States of California, Oregon and Nevada, and the Territories of Idaho, Washington Montana, Wyoming, Utah and Arizona. Lightest, Strongest, Cheapest and Best Balanced Pulley in the World. Also Manufacturers of

PAT. OCT. 25, 1881. SHAFTING, HANGERS AND APPURTENANCES.

☞ SEND FOR CIRCULAR AND PRICE LIST. ☜

Nos 129 and 131 Fremont Street - - - SAN FRANCISCO, CAL.

CHILLED CAR WHEELS.

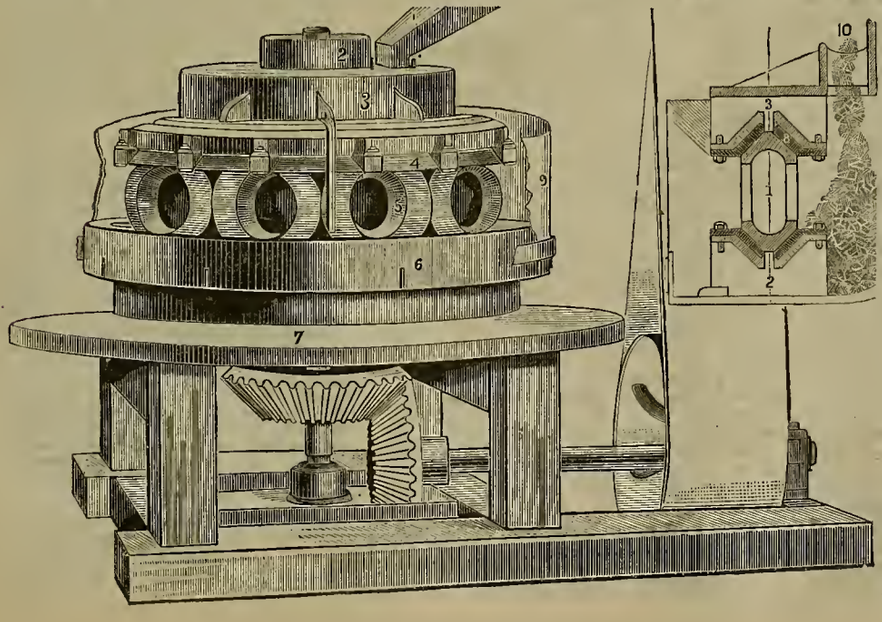
Medal Awarded, Mechanics' Fair, 1882.

STEIGER & KERR, Occidental Foundry,

No. 137 FIRST STREET, SAN FRANCISCO, CAL.

☞ IRON CASTINGS OF ALL DESCRIPTIONS.

HILL'S TRIUMPH ORE MILL. { THE KING OF Quartz Mills.



Awarded First Premium Mechanics' Fair, 1884.

Anti-Friction, Light Motive Power, Unequaled Results, A Low-Priced, Perfect and Economical Machine.

WORTHY OF INVESTIGATION.

SURE TO GIVE SATISFACTION.

F. A. HILL,

Inventor and Sole Owner

☞ Can be seen in operation at RICE'S MACHINE SHOPS, 56 Bluxome St., San Francisco, Cal. CALL AND EXAMINE IT.

☞ Descriptive Circulars and Terms sent on application, personally or by letter.

GOLD QUARTZ and PLACER MINERS.

Silver Plated

AMALGAMATING PLATES,

For Saving Gold.

First Premium Awarded at Mechanics' Fair, 1884.

Every description of plates for Quartz Mills and Wet or Dry Placer Amalgamator Machines made to order, corrugated or plain.

OVER 2,000 ORDERS FILLED.

The most extensive and successful manufacturer of these plates in the United States. Will fill orders for delivery in Rocky Mountain and Pacific Coast Mining States at lower prices than any other manufacturer.

Old Mining Plates Replated. Old Plates bought or gold separated for low percentage of result.

SEND FOR PRICE LIST.

SAN FRANCISCO PLATING WORKS,

653 & 655 Mission St., San Francisco Cal

E. G. DENNISTON, Proprietor.

CALIFORNIA ARTIFICIAL STONE PAVING COMPANY,

No. 404 Montgomery Street, San Francisco.

FIRST PREMIUM AWARDED AT MECHANICS' FAIR, (S. F.) 1884,

For ARTIFICIAL STONE PAVEMENT.

GOLD MEDAL AWARDED
AT
Mechanics' Fair, 1883 & 1884
FOR
Automatic Cut-Off Engine.
SILVER MEDAL AWARDED
1883
For Best Hoisting Engine and Boiler Combined.

W. H. OHMEN,

Machine and Engine Works

109 & 111 Beale St.

SAN FRANCISCO.

A Great Triumph!

WON BY THE MANUFACTURERS OF THE

EUREKA CEMENT,

GOULD & HILL, Proprietors,

103 and 105 Fremont St., San Francisco.

On the 25th day of August, 1884, Judge Sabin, of the United States Court of Equity, decided the great infringement case of the Salamanda Felting Company of New York and Philadelphia vs. the EUREKA CEMENT, in favor of the EUREKA CEMENT. This decision is one of the most important that has been rendered for many years, because it gives Messrs. GOULD & HILL the unrestrained right to continue the manufacture of the BEST COVERING FOR STEAM BOILERS AND PIPES that is known to the world

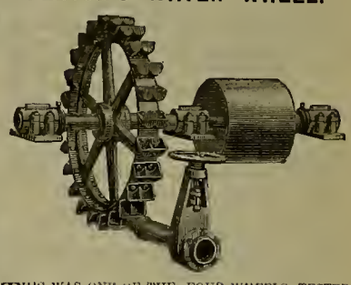
CLARENDON HOUSE,

574 Folsom Street, N. E. Cor. Second, S. F.

ENTIRELY RENOVATED & NEWLY FURNISHED.

Sunny Suites and Single Rooms with or without Board at reasonable rates. Hot and Cold Water. Folsom street cars pass the door. Location and Appointments unexcelled in San Francisco.

PELTON'S WATER WHEEL.



THIS WAS ONE OF THE FOUR WHEELS TESTED by the Idaho Company at Grass Valley, Cal., and gave 90 2 per cent., distancing all competitors. Send for Circulars and guaranteed estimates.

L. A. PELTON,
Nevada City, Nevada Co., Cal.

AGENTS—PARKE & LACY, 21 and 23 Fremont Street San Francisco, Cal.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,

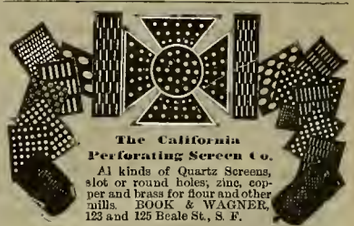
Manufactory, 17 & 19 Fremont St., S. F.

RICHARD C. REMMEY, Agent,

Philadelphia Chemical Stoneware Manufactory,

1100 East Cumberland St., PHILADELPHIA, PA.

Manufacturer of all kinds of Chemical Stoneware —FOR— Manufacturing Chemists. Also Chemical Brick for Glover Tower.



The California Perforating Screen Co.

All kinds of Quartz Screens, slot or round holes; zinc, copper and brass for flour and other mills. BOOK & WAGNER, 123 and 125 Beale St., S. F.

WM. BARTLING. HENRY KIMBALL

BARTLING & KIMBALL,

BOOKBINDERS,

Paper Rulers & Blnk Book Manufactnrere

505 Clay Street, Southwest cor. Sansome,

SAN FRANCISCO.

BOUND VOLUME OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce, and valuable for future reference and library use.

(Continued from page 277.)

sium citrate; again, pass hydrogen sulphide, collect the precipitation on a filter, redissolve it and the burned filter, add potassium citrate, again pass hydrogen sulphide, which leaves only nickel and cobalt in solution, without a trace of the earth or of silica. From this point, proceed as before.

In precipitating from the acetate solution with hydrogen sulphide, there should not be too much free acetic acid present. In precipitating from the citrate solution, or from the acetate with addition of citric acid, there must be a considerable quantity of free citric acid, or some cobalt and nickel will come down. Although not so directed by Crookes, I find it best to nearly neutralize the original solution with ammonia, before boiling with sodium acetate, to remove iron, alumina, arsenic and phosphorus.

If the ore contains chromium—a rare case that—the iron and alumina may be removed by cold digestion for several hours with barium carbonate, not omitting the addition of some ammonium chloride to prevent loss of nickel and cobalt. Afterward add sodium of sodium, or potassium, acetate, etc., as before.

The little known facts on which these modifications are based, are: That not only copper, lead, bismuth, etc., but also zinc is precipitated by hydrogen sulphide from the citrates or acetates in presence of free citric acid, while nickel and cobalt are not; that manganese is not precipitated by ammonia and ammonium sulphide in presence of an organic acid; that recently precipitated nickel sulphide is soluble in cold solution of potassium; cyanide, cobalt sulphide not.

If great accuracy is required, the ashes of the burned filter must be allowed for in the final weighings of nickel oxide, and in the case of cobalt sulphate, the ashes of a similar filter must be treated with sulphuric acid, dried, weighed, and the weight deducted.

STANDARD TIME.—In view of the fact that all the railroad clocks will be kept on "standard time" on and after November 1st, 1884, the following fact may be of interest: "The ignorance displayed by persons who oppose the adopting of 'standard' or 'meridian' time is ludicrous. Some of these wise individuals say it would be 'flying in the face of Providence and upsetting nature's laws' to change their clocks and watches a few minutes faster or slower than the 'sun time' they have observed. A very little investigation would show these people that the sun is right only four days in the year—frequently as much as 20 minutes out of the way—and is about the most irregular 'timepiece' in existence. The railroads having generally adopted the new standard, all local time should be made to conform therewith, and so do away with the confusion now existing at many points."

THE JACKSON CREEK MINES.—The Carson *Appeal* has the following relative to the Jackson Creek mines, in which several Carson men are interested: "The recent discoveries of extensive deposits of copper and silver ore in the northern part of Humboldt county, indicate that Nevada has not yet seen her palmiest days, and if the accounts of prospectors recently returned from that district can be relied on, one may expect a revival of the good old Comstock days. Samples of the copper and silver ore have been brought to this city; also a nugget of pure copper, said to have been picked up in the bed of a creek that runs through the hills where the ledges were found. There is an inviting field here for the investment of a little capital."

THE Rediugton quicksilver mines, of Knoxville, Cal., are now making about 25 flasks, or 1,900 pounds, of quicksilver per week from lower-grade ore, which has accumulated as waste about the mines for the past 15 years. No new ore is being taken out, nor will the mine be worked for new ore until the price of mercury advances. The metal brings now about $29 per flask, containing 76½ pounds. Forty dollars per flask is considered but a living market price by the miners. These mines are about 20 years old. During this time they have produced $3,000,000 worth of quicksilver, and disbursed at least $2,000,000 in Napa county.

PITTSBURG nail manufacturers claim that they can place nails on the market at $1.75 per keg and make a profit.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M & M Co	Alaska	8	70	Oct 14	Nov 15	Dec 5	E F Stone	306 Pine st
Andes M Co	Nevada	25	25	Sept 23	Oct 28	Nov 20	B Burris	309 Montgomery st
Butte Creek Hyd M Co	California	10	10	Sept 23	Nov 6	Nov 29	R L Taylor	230 Montgomery st
Cahorca M Co	Mexico	9	03	July 18	Nov 1	Dec 1	C Bovie	328 Montgomery st
Chollar M Co	Nevada	15	50	Oct 29	Dec 2	Dec 23	G L McCoy	309 Montgomery st
Daisy Cement M Co	California	2	02	Sept 26	Nov 8	Nov 29	C J Collins	512 Montgomery st
Day S M Co	Nevada	15	75	Sept 26	Nov 3	Dec 2	E M Hall	327 Pine st
Gould & Curry S M Co	Nevada	49	50	Oct 25	Nov 29	Dec 22	A K Durbrow	309 Montgomery st
Golden Fleece G M Co	California	34	40.00	Oct 15	Nov 18	Dec 8	F Schirmeier	412 Sixth st
Indian Spring Drift M Co	California	3	03	Sept 17	Oct 18	Nov 15	A B Paul	328 Montgomery st
Justice M Co	Nevada	41	15	Sept 11	Oct 11	Nov 5	R E Kelly	412 California st
Lamphire G M & M Co	California	1	10	Oct 3	Nov 17	Dec 8	A Martin	526 Montgomery st
Peerless M Co	Arizona	2	25	Sept 25	Nov 3	Nov 29	A Waterman	309 Montgomery st
Rainbow M Co	California	12	15	Oct 24	Dec 3	Dec 29	F F Marhardt	341 Montgomery st
Standard M Co	California	1	25	Oct 17	Dec 1	Jan 5	W Willis	309 Montgomery st
Sierra Nevada S M Co	Nevada	80	50	Oct 22	Nov 26	Dec 25	E L Parker	309 Montgomery st
Solid Silver M Co	Nevada	4	16	Sept 23	Oct 25	Nov 12	R Hewson	5 First st
Sterling M Co	California	1	05	Sept 18	Oct 23	Nov 20	W H Allen	306 Pine st
Tunitas Petroleum Co	California	2	1.00	Sept 29	Oct 31	Nov 15	S F Springer	601 California st
Utah S M Co	Nevada	51	50	Oct 23	Nov 28	Dec 16	G C Pratt	309 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Bonanza King M Co	California	D C Bates	309 Montgomery st	Annual	Nov 12
Fremont M and M Co		M T Ashby	402 Front st	Annual	Nov 11
Hamburg M Co	Nevada	D Jennings	401 California st	Annual	Nov 11
Western Quicksilver Co	California	A Halsey	328 Montgomery st	Annual	Nov 5

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	G W Sessions	309 Montgomery st	50	June 5
Bertree Blue Gravel M Co	California	D Wetzel	522 Montgomery st	10	Oct 8
Idaho M Co	California			4.00	Apr 2
Jackson M Co	California	D C Bates	309 Montgomery st	10	Mar 16
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 21
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Oct 29
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Mar 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Nov 6

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 9.		WEEK ENDING Oct. 16.		WEEK ENDING Oct. 23.		WEEK ENDING Oct. 30.	
Alpha	1.40	1.60	1.25	1.25	1.40	1.15	1.45	
Alta	1.55	1.95	1.65	1.75	1.60	1.90	1.60	1.75
Andes	.10	.15	.10	.05	.10	.05	.35	
Argenta								
Belcher	.85	.90	.80		.85		.75	
Belding		.10						
Best & Belcher	1.60	1.95	1.75	1.35	1.50	1.80	1.70	1.90
Bullion	.25	.30	.25	.30	.35		.27	
Bonanza King								
Belle Isle	.40	.50	.40	.45	.35	.55	.45	.50
Bodie Con	2.05	2.35	2.10	2.20	2.10	3.05	2.70	2.80
Benton	.45	.60	.50	.50	.55		.45	
Bodie Tunnel								
Bulwer	.60	.65	.65	.55	.80	.65	.75	
California	.35	.40	.35	.40	.35	.55		.45
Challenge	.20	.25		.20	.25			
Champion						.30		
Chollar	2.05	2.15	2.00	2.15	2.00	2.80	2.30	2.50
Confidence	1.00	1.25						
Con. Imperial								
Con. Virginia	.15	.25	.15	.20	.35	.40		.45
Con. Pacific	.60	.90	.80	1.00		.85	.85	.90
Crown Point	1.40	1.60		1.35	1.35	1.45		1.40
Day		.05						
Eureka Con	2.90	3.10	3.10	3.20	2.10	2.75		3.50
Eureka Tunnel								
Exchequer	.25	.35		.25	.10	.35	.20	.25
Grand Prize	.30	.40	.25	.35	.25	1.25		.15
Gould & Curry	1.20	1.45	1.15	1.20	1.00	1.25	1.10	1.30
Goodshaw								
Hale & Norcross	2.50	2.90	2.45	2.75	2.70	3.30	3.10	3.20
Holmes	2.50	3.50	3.35	4.00	3.00	3.25		
Independence								
Julia								
Justice	.10	.15		.10	.20	.25		.20
Martin White		.30		.40		.40	.40	.45
Mono	1.35	1.80	1.50	1.65	1.50	2.00	1.60	1.70
Mexican	1.20	1.55	1.20	1.35	.90	1.20	1.00	1.15
Mt. Diablo	3.00	3.25	3.25	3.50	3.40	3.75		3.60
Northern Belle								
Navajo	3.55	3.60	3.50	3.65	3.85	3.95	3.80	3.90
North Belle Isle	.40	.45		.45	.50	.60	.45	.50
Occidental	1.10	1.25	1.20	1.25	1.35	1.50	1.45	1.50
Ophir	1.05	1.20	.80	1.10	.75	.95	.80	.90
Overman	.15	.20		.15	.15	.20	.15	.20
Potosi	1.00	1.25	1.00	1.10	1.05	1.30	1.20	1.30
Final Con								
Savage	.85	1.35	1.25	1.30	1.25	1.40	1.35	1.40
Seg. Belcher						1.00		
Sierra Nevada	1.25	1.40	1.05	1.30	.85	1.25	.95	1.10
Silver Hill								.05
Silver King	.10	4.35				4.15		4.15
Scorpion	.20	.25		.15	.15	.60	.14	.15
Syndicate		.45		.50	.60	.65		.55
Tioga								
Union Con	1.05	1.20		1.05	.80	1.10	.80	.90
Utah	1.05	1.20	1.00	1.00	.50	.90	.60	.80
Yellow Jacket	1.80	2.00	1.65	1.90	1.70	1.85	1.80	1.85

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Oct. 30.

1750	Alta	1.00@1.30	
300	Bodie	2.65@2.70	
200	B. & Belcher	1.70	
100	Belmont	1.40	
1560	Benton Con	.30@35c	
100	Belcher	.70c	
200	Con. Pacific	.90c	
150	Crown Point	1.20	
900	Hale & Norcross	3.20	
150	Holmes	3.40@3.50	
10	Mexican	1.00	
20	Navajo	3.80	
200	N. Belle Isle	.45c	
410	Ophir	.80@85c	
50	Sierra Nevada	1.00	
100	Syndicate	.55c	
110	Savage	1.30	
20	Utah	.60c	
	AFTERNOON SESSION.		
1440	Alta	1.30@1.35	
70	Bodie Con	2.75	
100	Bulwer	.55c	
600	Benton	.35c	
500	Belmont	1.05	
400	Belle Isle	.50c	
100	Chollar	2.20	
23	Con. Virginia	.40c	
50	Crown Point	1.25	
100	Con. Pacific	.90c	
100	Challenge	.20c	
100	Exchequer	.20c	
100	Gould & Curry	1.30	
500	Grand Prize	.20c	
340	Hale & Nor	3.10	
200	Justice	.15c	
350	Mexican	1.00	
100	Mt. Diablo	3.80	
300	Ophir	.90c	
50	Overman	.15c	
400	Potosi	1.10@1.15	
100	Syndicate	.55c	
475	Sierra Nevada	1.00	
450	Savage	1.30	
110	Union	.85@90c	
100	Yellow Jacket	1.70	

Bullion Shipments.

Bonanza King, Oct. 23, $8,023; Christy, 24, $6,263; Grand Prize, 23, $7,000; Navajo, 27, $14,500; King, 25, $11,951; Bismark, 25, $5,872; Cuba, 25, $6,379; Lexington, 13, $21,136; Alice, 13, $10,970; Moulton, 17, $13,648; Alice, 17, $20,176; Hanauer, 21, $5,600; Queen of the Hills, 21, $5,200; Crescent, 21, $2,400; Horn Silver, 21, $12,000; Ontario, 21, $8,000; Day, 22, $4,205; Horn Silver, 22, $12,000; Stormont, 22, $2,890; Queen of the Hills, 22, $1,470; Mayflower, 22, $2,570; Hanauer, 23, $6,000; Nevada ore, 23, $3,850; Mayflower, 23, $2,050; Hanauer, 23, $6,000; Christy, 23, $1,725; Ontario, 23, $10,967; Hanauer, 24, $3,600; Queen of the Hills, 24, $1,500; Horn Silver, 24, $9,000; Ontario, 24, $3,699; Hanauer, 26, 3,500; Crescent, 26, $3,650; Queen of the Hills, 26, $1,450; Horn Silver, 24, $9,000; Christy, 24, $1,025; Ontario, 26, $4,381.

Mining Share Market.

There is very little news to report in connection with the mining stock market. Dullness continues to prevail, and, as in the other line of business, no special improvement is looked for until after the Presidential election excitement subsides. On the Comstock, at the north-end mines some interesting work is in progress. A north drift has been started on the 3000 level of the Sierra Nevada at a point where there are streaks of quartz that will assay as high as $40 per ton. No work has been done in the Sierra Nevada mine to the northward on this level. A drift was run southward in the Union Con. ground until the ore deposit scattered and disappeared. To the northward this deposit of low-grade ore may prove better and more permanent.

The station at the 3300 level of the joint Ophir, Mexican, Sierra Nevada and Union Con. winze is completed and a diamond drill hole has been started west. Interesting work is in progress in both the Best and Belcher and the Gould and Curry. The Gold Hill mines are now employing quite a large number of men and are sending 10 mills on the Carson river all the ore that can be reduced.

A CHEAP MILL.—It would seem that about as cheap a quartz mill as can be constructed can be gotten up with an ordinary Burleigh or Ingersoll drill, a stamp being attached in place of the drill. Superintendent Boyle, of the Alta mine, has so rigged a drill for prospectiog purposes, and he finds that he can crush about twelve tons of ore per day with it. Such a drill costs but about $300, therefore for about $600, not counting in the boiler that would be required to produce the steam for running, one might rig up a mill having a capacity of twenty-four tons per day. The next improvement made in quartz mills will probably be to apply the steam directly to each stamp, the stem of the stamp moving as a piston in a cylinder.—*Virginia Enterprise.*

IT is asserted that the closing down of industrial establishments in Carondelet, Mo., has ruined that city, from which 12,000 people, it is estimated, have migrated since January 1, 1883.

ALABAMA'S coal fields, as yet practically untouched, are half as large as those of England

San Francisco Metal Market.

[WHOLESALE.

THURSDAY, Oct. 30, 1884.

ANTIMONY—Per pound		@	—
Hallett's		13 @	—
Cookson's		14 @	—
BORAX—Refined		7½@	8
IRON—Glengarnock ton		25 00 @	—
Eglinton, ton		24 00 @	—
American Soft, ton		25 50 @	—
Oregon Pig, ton		— @	—
Clipper Gap, Nos. 1 to 4		30 00 @	32 50
Clay Lane White		22 00 @	—
Shotts, No. 1		26 00 @	—
Refined Bar		3 @	5½
Boiler, 1 to 4		5 00 @	5 50
Plate, 5 to 10		4½@	4¾
Nail Rod		7 @	—
Norway, according to thickness		6 @	7
STEEL—English, lb		16 @	25
Black Diamond, ordinary sizes		13 @	—
Drill		15 @	—
Machinery		12 @	14
COPPER—Ingot		14 @	15
Braziers' sizes		7 @	37
Fire-box sheets		28 @	—
Bolt		23 @	25
Bar		— @	—
Cement, 100 fine		12 @	—
Copper in New York, Oct. 29		12¾@	—
LEAD—Pig		3½@	4
Bar		5½@	—
Pipe		7 @	—
Sheet		8 @	—
Shot, discount 10% on 500 bag s: Drop, ₱ bag		1 85 @	—
Buck, ₱ bag		2 05 @	-
Chilled, do		2 25 @	—
TIN PLATES—Charcoal		6 25 @	7 25
Coke		5 75 @	6 75
Pig		19 00 @	20 00
Banca tin		22 @	23
I. C. Charcoal Roofing, 14x20		6 25 @	6 50
ZINC—German		9 @	10
Sheet, 7x3 ft, 7 to 10 lb, less the cask		9 @	10
QUICKSILVER—By the flask		30 00 @	—
Flasks, new		1 95 @	—
Flasks, old		85 @	—

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & CO.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.]

FOR WEEK ENDING OCTOBER 21, 1884.

306,720.—CAR COUPLING—Colby & Safford, Otego, Nev.

306,903.—QUARTZ CRUSHER—C. Dandurand, Va., Nev.

306,920.—APPARATUS FOR MAKING EXPLOSIVE COMPOUNDS—O. B. Hardy, S. F.

306,830.—OVERSHOE—H. O. Hooper, Fresno, Cal.

307,051.—JOURNAL BOX—D. Jones, Palouse, W. T.

306,846.—BELL PLATE AND CARD RECEIVER—John G. Mattheis, Alameda, Cal.

306,864.—SAFETY STOVE FOR RAILWAY CARS—C. Rowell, S. F.

306,871.—FIRE ESCAPE—Chas. F. Shore, Sac'to.

306,981.—GREASE TRAP—Nathl T. Whiting, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

AUTOMATIC LUBRICATING CUP AND FILTER.—John F. Smith, assignor of one-half to John Williams. No. 306,542. Dated Oct. 14, 1884. This self-acting oil cup and filter consists of a cup of any suitable material, with a stem adapted to pass down through the cap of the bearing or journal box, to a point nearly in contact with the revolving shaft. This stem is of considerable diameter, closed at the lower end, and having small perforations, through which oil may pass out by the action produced by the revolution of the shaft. The interior of the tube is filled with alternate layers of material, which may serve as a filter, and a screw-stem extends through the cover and into the top of this tube, so that it may be made to press upon the material within to any desired degree.

ENGINE GOVERNOR.—John P. Simmons, S. F. Assignor of one half to W. H. Ohmen. No. 306,541. Dated Oct. 14, 1884. This governor consists of a hub loosely revolving upon the engine shaft and having formed with it or attached to it an eccentric by which the valve is moved. A circular disk or casing is fixed to the engine shaft by the side of this hub, and has two arms pivoted near its circumference at opposite sides, the inner ends of these arms approaching the hub and connecting with it by straps. Weights are adjusted upon these arms, and when the engine shaft revolves, the centrifugal force carries the weights and the unattached ends of the arms outward, thus rotating the hub and eccentric upon the shaft, and changing the relative motion of the valve gear to that of the crank. Other straps passing around the hub extend to adjustable eccentric or cone-shaped arcs, which are pivoted within the dirk, and have springs acting upon their axes, so that when the speed of the engine becomes slower these curved arcs with the springs act to draw the eccentric back to its original position.

GATE.—George W. Scott, Lemoore, Tulare Co. No. 306,534. Dated Oct. 14, 1884. The invention relates to that class of gates in which suitable levers and cords on the roadside are adapted to open and close the gate; and the invention consists in a suitable framework of ribs and posts, in a laterally sliding gate operated by a vertically moving traveler and suitable connecting ropes; and a certain lever and a weight for operating the traveler, and a catch and trip mechanism for temporarily securing and releasing it. The object is to provide an automatic gate, simple and inexpensive in construction, effective in operation and easily set in place.

PORTABLE DERRICK.—Donald Crane, Woodland, Yolo Co. No. 306,134. Dated Oct. 7, 1884. In handling hay and grain in the harvest field it has become customary to employ portable derricks, which may be transported from place to place by laying the mast horizontally, it being raised to a perpendicular position, and suitably guyed wherever it is necessary to use it. The truck or frame upon which the derrick is supported is usually mounted upon wheels, so as to form a wagon to carry the derrick. The mast being long and heavy, many devices have been employed to raise and lower it with the least amount of trouble. Mr. Crane's invention consists mainly in an improved means for lowering and raising the mast, and of the attachment of the boom to the mast in such a manner that it may be caused to swing to either side as desired by gravitation, without changing the position of the mast from the perpendicular.

DEVICE FOR RAISING AND LOWERING WINDOWS.—Harriet W. Strong, Oakland. No. 306,188. Dated October 7, 1884. This device for raising and lowering the upper sash of

a window consists in a metal socket having a flanged rim and a central transverse bar, said socket being let into the face of the upper bar of the sash and in a peculiar hook adapted to enter the said socket and engage the cross-bar and flange. When the force is exerted upwardly in order to raise the sash, the top of the hook or the pole presses against the upper wall or roof of the socket, while its body and point are confined by the cross bar and by the flange of the socket, and are securely held. The peculiar bend of the hook, enables it to be readily inverted in the socket, and a slight turn is sufficient to carry its point behind the cross bar by which it is held in place.

PUMP.—Geo. P. Harding, Woodland, Yolo Co. No. 306,152. Dated Oct. 7, 1884. This invention relates to that class of pumps in which the piston is operated by a cam, and it consists of a novel cam and in the arrangement of pistons connected therewith, whereby the pump is operated to the best advantage. The object of the invention is to operate the pump with the least expenditure of power and to its greatest capacity, producing a continuous discharge.

News in Brief.

SOLANO'S assessment roll aggregates $17,281,778.

THE grading for the narrow-gauge road in Long valley, Lassen county, is progressing rapidly.

THE Czar promises to take measures to suppress the persecution of the Jews in his dominions.

THE subject of holding a World's Exhibition in Berlin is being seriously agitated in the Prussian capital.

BEARS are being killed by the dozen in Lewis county, W. T., and are more plentiful than ever before known.

THROUGHOUT Italy there is great suffering among the poor by reason of the cholera, and in many cities business is at a stand-still.

THE Territories of New Mexico and Arizona are in danger of becoming speedily over stocked with large droves of young breeding stock from Texas.

ABOUT six miles of land have been cleared for the Esquimalt and Nanaimo Railroad, and the work is progressing as rapidly as practicable.

THE San Gabriel Fruit Growers' Association met Saturday, to adopt a standard fruit box for oranges, lemons, limes, and deciduous fruits of all kinds.

A HALF million pounds of apples have been shipped this season from Boise valley, I. T. A great many pears and plums have also been shipped from there.

AT the request of the State Board of Agriculture, Prof. Wiley, a sorghum expert, is to be sent to this coast immediately by the Department of Agriculture.

THERE are four ladies on the Grand and an equal number on the Petty Jury in attendance on the present term of the District Court in Klickitat county, W. T.

AN Indian in the Cascade mountains shot and wounded an elk the other day, and before he could reload his gun the elk charged and killed him with his sharp feet.

FIVE HUNDRED dogs, valued at $500,000, are now on exhibition in a New York garden. Among them are the Esquimaux dogs brought by the Greely relief expedition.

THERE have been 13,132 deaths from cholera in Europe since the disease made its first appearance there, about four months ago. Nearly half of these deaths occurred in the province of Naples.

OYAMA, the Japanese Minister of War, and the officers visiting with him, are engaged at present in studying the administration of the German War Office. They have adopted every detail of the German system.

THE movement inaugurated in the highest social circles in St. Petersburg, which has for its object the amelioration of the sentences recently imposed on the anti-Jewish rioters, is making remarkable progress.

SEVERAL train-loads of cannon and munitions of war have been dispatched to Hamburg for shipment to the German stations in West Africa. The government has ordered a series of small forts to be built there.

A CIRCULAR has been sent to the Governors of all the States and Territories in the Union, requesting each to appoint one delegate at large to the National Cattle Men's Convention to be held in St. Louis on November 17th.

THE Government of the United States of Columbia has informed the Panama Railroad Company that it will not allow that company's line of railroad to be cut, changed or damaged for the benefit of the De Lesseps canal.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
J. J. BARTELL—Sacramento County.
A. C. KNOX—Nevada State).
GEO. MCDOWELL—Alameda and Santa Clara Counties.
WM. PASCOE—San Francisco.
WM. H. COOK—Los Angeles County.
H. G. PARSONS—Montana and Idaho.
G. W. INGALLS—Arizona.
D. K. BRAMBLE—Humboldt and Del Norte Counties.
W. WHITWELL—Oregon.

THE ostriches at Acahein are thriving well and the young ones, about 40, are growing nicely. One of the latter, four months old, was weighed the other day and lowered the scales at 10 pounds. The incubators will be set going again in a few days.

A MONUMENT to Kit Carson is to be unveiled at Santa Fe, December 1st.

PROGRESS IN SCIENCE.—The developments of physical science have received a wonderful impetus within the last ten years. Twenty odd years ago, according to the chief literature on opthalmology, we find very conflicting opinions entertained by many eminent physiologists regarding the pathology of the eye when accommodation was not understood nor the cardinal points of physiological dioptries. Astigmatism of the eye is very often treated for amblyopia, amarosis, etc., while it is a mechanical defect, and can be corrected by simple or compound lenses correcting the errors of refraction. Many to this day don't comprehend the difference of refraction or accommodation. Old sight, or presbyopia, is ranked with a faulty formation, and the belief still exists in the minds of many that as a person grows older the eyes fatten. Having tested over 2,000 complicated cases of defective sight in the last three years, which I have a record of, I confidently solicit all who are troubled with painful forebodings of loss of sight and defective vision, inflammation of the eyes, to avail themselves of my professional services free of charge.

C. MULLER, Optician,
x 135 Montgomery St., near Bush St.

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OUR U. S. AND FOREIGN PATENT AGENCY presents many and important advantages as a Home Agency over all others, by reason of long establishment, great experience, thorough system, intimate acquaintance with the subjects of inventions in our own community, and our most extensive law and reference library, containing official American and foreign reports, files of scientific and mechanical publications, etc. All worthy inventions patented through our Agency will have the benefit of an illustration or a description in the MINING AND SCIENTIFIC PRESS. We transact every branch of Patent business, and obtain Patents in all countries which grant protection to inventors. The large majority of U. S. and Foreign Patents issued to inventors on the Pacific Coast have been obtained through our Agency. We can give the best and most *reliable* advice as to the patentability of new inventions. Our prices are as low as any first-class agencies in the Eastern States, while our advantages for Pacific Coast inventors are far superior. Advice and Circulars free.

DEWEY & CO., Patent Agents.
No. 252 Market St. Elevator, 12 Front St., S. F. Telephone No. 658.

A. T. DEWEY. W. B. EWER. GEO. H. STRONG.

ASSESSMENT NOTICE.

The Lamphire Gold Mine and Milling Company—Location of principal place of business, San Francisco, Cal.; location of works, Tuolumne Mining District, Tuolumne County, Cal.

NOTICE is hereby given that at a meeting of the Board of Directors, held on Friday, the third (3d) day of October, 1884, an assessment (No. 1) of ten (10) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the President, David McClure, at the office of the company, room No. 2, No. 526 Montgomery street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on Monday, the seventeenth (17th) day of November, 1884, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the eighth (8th) day of December, 1884, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

ADDISON MARTIN, Sec'y.

OFFICE—Room No. 2, No. 526 Montgomery Street, San Francisco, California.

STOCKHOLDERS' MEETING.

Notice is hereby given that a meeting of the Stockholders of Fremont Mining and Milling Company will be held at the Company's office, No. 402 Front Street, Room 8, San Francisco, California, on Tuesday, November 11th, 1884, at 12 o'clock M., for the purpose of electing officers for the Company, and of acting upon a proposed amendment of the By-Laws of the Company, providing that vacancies in the offices of President, Vice-President, and Trustees, shall be filled by the Board of Trustees.

MARK T. ASHBY, Secretary.

L. PETERSON,
INVENTORS. MODEL MAKER,
253 Market st., N. E. cor. Front, up-stairs, S. F. Experiments machinery and all kind of models, tin, copper and brass work.

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May we suggest as the result of a long experience in the manufacture and use of Oil, the following facts:

1. Generally, twice as much Lubricating Oil is used as is necessary.
2. The Oils generally used in the West, cost too much money.

There is no use of paying the high prices necessarily demanded for Lard, Tallow, Castor, China-nut, and other animal and vegetable Oils sold for Lubricating purposes.

WE GUARANTEE TO SAVE FROM 25 TO 50 PER CENT.

☞ Please write us briefly for what purpose the Oil is used, and we will return GRATIS enough oil to prove what we say. Our oil has now been adopted as

Cheaper, More Economical, and More Serviceable than any other Oil

On the Central and Southern Pacific Railroads, the Northern Pacific, South Pacific Coast, and North Pacific Coast Railroads, the Oregon Railway and Navigation Co., Pacific Coast Steamship Co., and all the prominent Iron Works, Saw-mills, etc., on the Coast and Puget Sound. ADDRESS:

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CHARLES J. WOODBURY, Manager Lubricating Department,
123 California Street, San Francisco, Cal.

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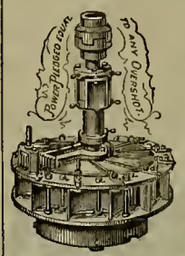
With Important Improvements, making it the



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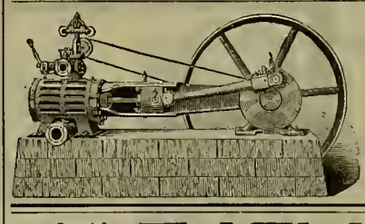

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A Plain Book on Assaying.

"ASSAYING GOLD AND SILVER ORES"—By C. H. Aaron—Is a new work published by Dewey & Co., which is intended by its author to be available for the use of miners, prospectors and others who only care to know how to assay gold and silver ores.

The author of this work is well known in the mining regions of the Pacific coast as a practical metallurgist of many years experience. His writings for the press and his two previous works ("Testing and Working Silver Ores," and "Leaching Gold and Silver Ores") have shown his ability as a writer. The little book is plainly and simply written, more especially for the use of those persons not familiar with chemistry. No symbols are used, everything being plainly stated and clearly described. The scope of the book is shown in its table of contents as follows: Introduction; Implements; Assay Balance; Materials; The Assay Office; Preparation of the Ore; Weighing the Charge; Mixing and Charging; Assay Lithargе; Systems of the Crucible Assay; Preliminary Assay; Dressing the Crucible Assays; Examples of Dressing; The Melting in Crucibles; Scorification; Cupellation; Weighing the Bead; Parting; Calculating the Assay; Assay of Ore Containing Coarse Metal; Assay of Roasted Ore for Solubility; To Assay a Cupel; Assay by Amalgamation; To Find the Value of a Specimen; Tests for Ores; A Few Special Minerals; Solubility of Metals; Substitutes and Expedients; Assay Tables. These assaying tables give simple directions for figuring out results. This is the simplest, cheapest and most easily comprehended work on assaying yet published. The volume comprises 106 pages, with illustrations, and is well bound in cloth. The price is $1, postpaid. Published by Dewey & Co., MINING AND SCIENTIFIC PRESS office, San Francisco—1884.

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Cost $200, price $150; 1 pair of 32-inch Shears and boxes, cost $30, price $20; 1 500-lb. Ore Bucket, cost $35, price $25; 270 feet of ⅝ Wire Rope, cost $67.50, price $40.

All the above are in good condition and have never been used. Apply to

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Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First street, a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below costs, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. References as to above can be had upon applying to this office.

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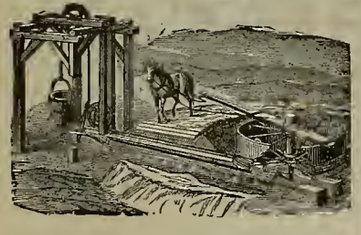

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A recent competitive test made with the Frue at the Carlisle mine, in New Mexico, showed an advantage of 30 per cent in favor of the Duncan. The amount saved over the Frue being sufficient to pay the entire cost of the machines nearly every month of the year. The following is an enumeration of its many advantages over all other similar machines:

1. Its cost is not more than half that of any other of equal capacity, and the weight is nearly 1,000 pounds less, thus greatly reducing the cost of transportation.
2. The expense of setting up in running order is not more than one-third that of the Frue, or any other belt machine, much less grading and timber work being necessary.
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5. No special skill and very little care is necessary to operate it.
6. No more water is required than is furnished by the batteries.
7. It saves all the amalgam, gold or silver, that escapes the batteries, pans or settlers—AN INVALUABLE FEATURE, and claimed by no other, making the machine worth more than it costs for this purpose alone.
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We are aware that the most sweeping and pretentious claims are made for nearly every concentrator in the market, but it is a well-known fact that the results of their operation have not in any instance made good these claims. The advantages here set forth for the Duncan, as well as the statements made, we are prepared to substantiate by actual working results. **Price, $350. Weight, about 1,750 pounds.**

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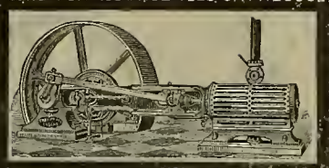

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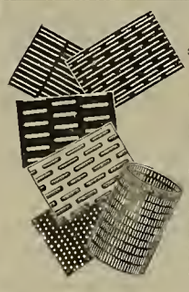

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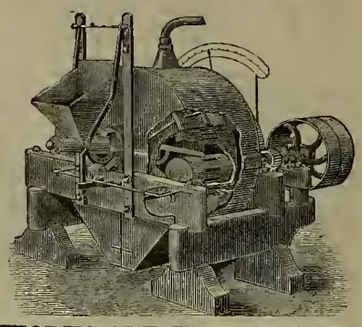

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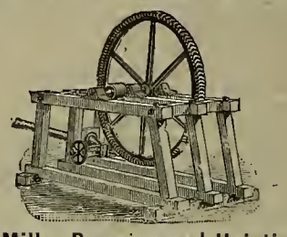

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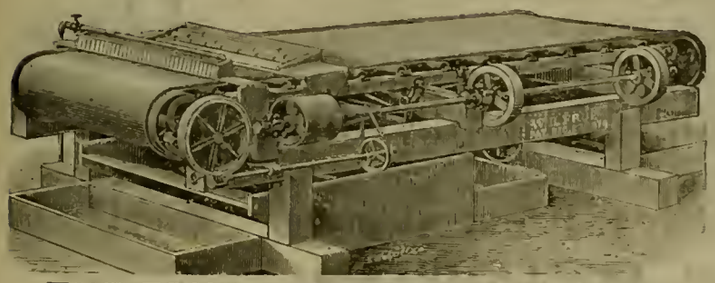

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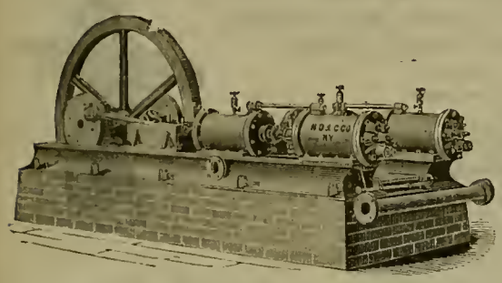

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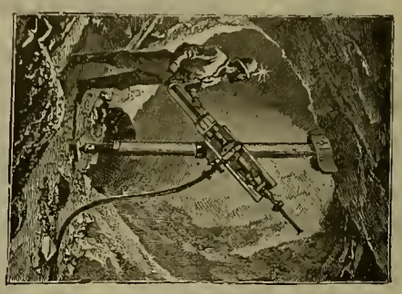

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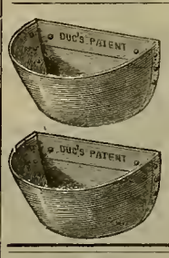

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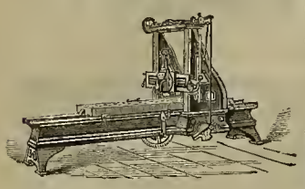
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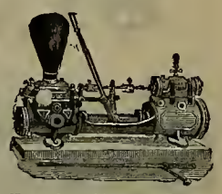
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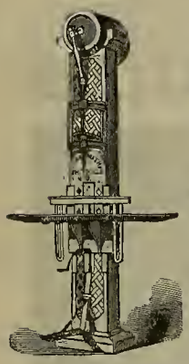

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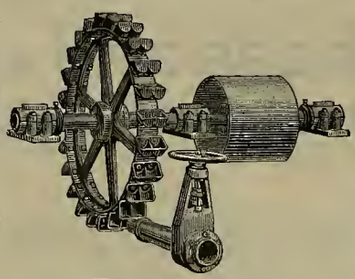

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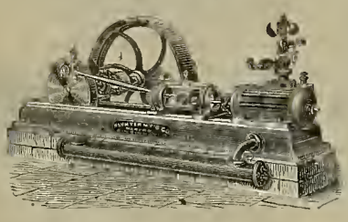
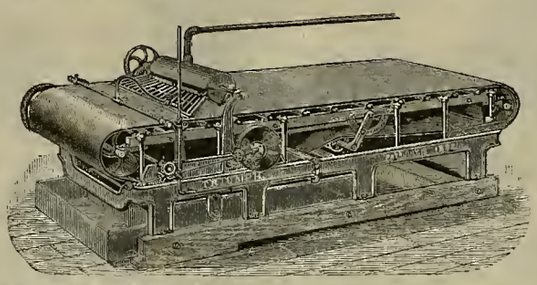
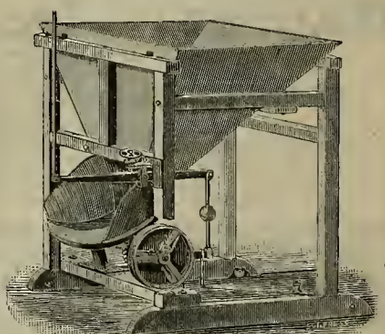




"Challenge" Ore Feeders.



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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, NOVEMBER 8, 1884.

VOLUME XLIX Number 19.

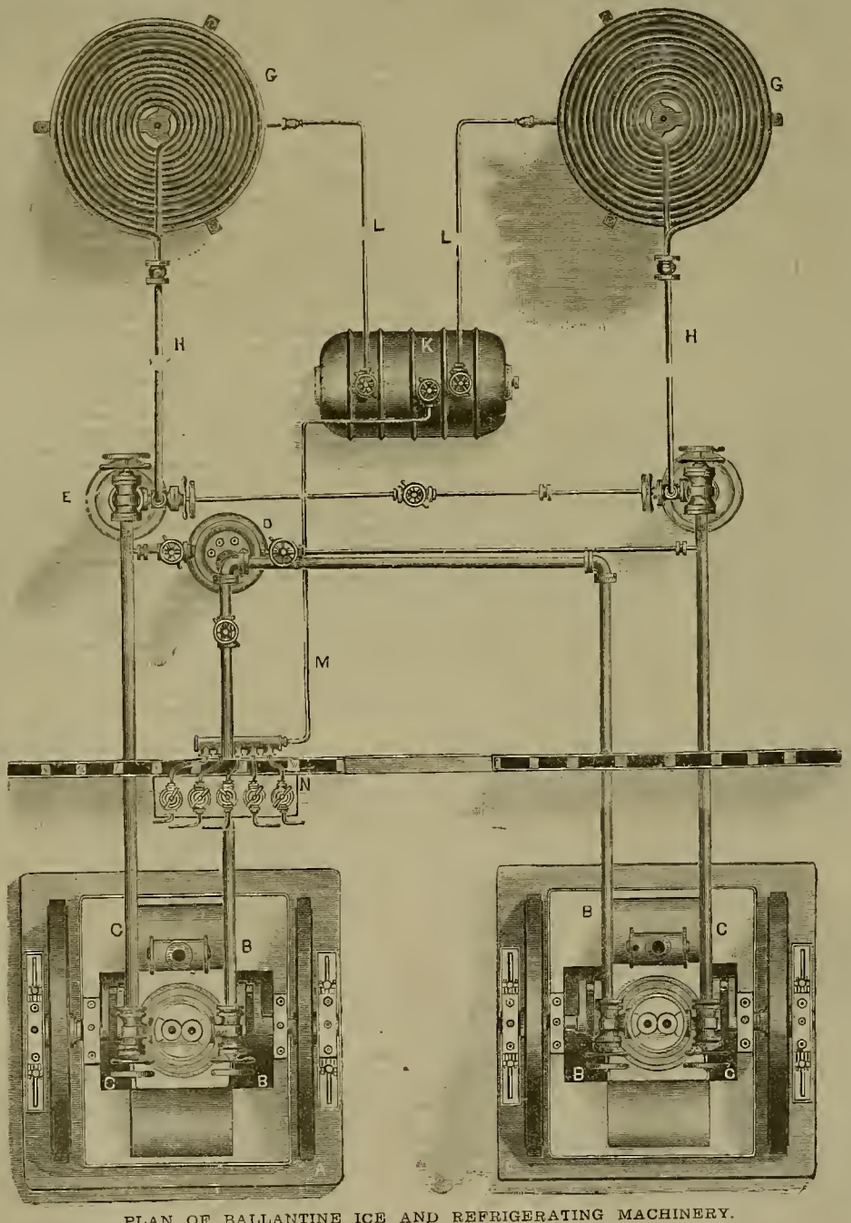
Ice and Refrigerating Machinery.

The engravings on this page and on page 293 represent the Ballantine ice and refrigerating machine, for ice making and artificial refrigerating in all places, where a low degree of temperature and dry atmosphere are required. This machinery is made by the Cummer Engine Co., of Cleveland, Ohio. The engravings give a view of the machine, together with the arrangements of the entire plant.

From the receiver "K," which contains the necessary liquid anhydrous ammonia through pipe "M," and feed-cocks "N," the liquid is passed through heavy small pipes, in exactly desired quantities, into the end of the freezing coils, in the different rooms, cellars, brine-vats, water and ammonia coolers to be cooled, and the other end of these different coils is directly connected with the collector "D." The expanded ammonia gas which has a pressure only of 5 to 20 pounds per square inch, is drawn through suction "B," and suction cock "B," into the compressor "A," the lower part of which is a steam cylinder, and the upper part a gas compressor, having on one side the suction cock "B," which draws the gas into the cylinder and compresses it to from 125 to 150 pounds per square inch, according to the amount of heat extracted from the cooling rooms, and the temperature of the condensing water, and the latent heat contained in said gas, is converted into sensible heat. The compressed hot gas is then passed through pressure cock "C," to the oil drip "E," where, by a simple and ingenious arrangement, all impurities, as well as oil are separated, and the pure hot gas is passed through pipe "H," under the same pressure through condenser "G," which consists of about 20 separate spiral coils of pipe, each containing 150 feet, and placed about four inches apart. With the combined arrangement of a water-sprinkler "I," and the draft of air, the sensible heat is taken from the hot gas, and, under the pressure contained in the condenser, the gas is liquified again and passed from its lower coil through pipe "L," to receiver "K," to be again passed through the small pipe "M," and the feed-cocks "N," through the coils in the different rooms, cellars, brine-vats or ammonia beer-cooler. There has been lately attached, and forming a part of the plant, a purifier "F," out of which at any time, without stopping the machine, water, oil, or other refuse, which always largely impair the efficiency of the cooling surfaces, can be removed.

The oil drips are also connected with each other, so where two or more engines and condensers are used, any one engine can be worked with both or any one condenser, so in case of accident no delay in the working of the plant can take place.

Of several machines in use, which have been running for over two years, the manufacturers state that not one of them has had a pound of gas added to the original charge, nor has the pressure of gauge ever shown the pressure of air. The manufacturers claim for this machinery the following advantages: The machines work easily and smoothly, and without noise. They do not require skilled attendance and constant watching. They use less fuel and less than one-half the water which other systems require. They produce as low a temperature as may be desired, and maintain a perfectly dry atmosphere. The ammonia cylinder is so thoroughly sealed that no air can enter, nor can any gas escape. There is no odor, no appreciable loss of gas, the machines run for years without recharging, and there is no corrosive action whatever.



PLAN OF BALLANTINE ICE AND REFRIGERATING MACHINERY.

Encouragement to Inventors.—The Government of Victoria, Australia, offers a reward of £20 for the invention of improved machines for reaping and harvesting grain, which shall be an improvement on machinery at present in use in Victoria. The reward will be paid to the inventor of one machine, or may be apportioned according to the value to the colony of inventions entered for competition. Intending competitors must give notice in writing, to be delivered not later than Dec. 1, 1884, to the Secretary for Agriculture, Melbourne, Victoria, Australia.

The Santa Rosa foundry molded the first castings on Tuesday, November 4th.

New Gold-Saving Apparatus.

Henry R. Brown and Orrin Field, of Byron, Contra Costa county, in this State, have patented, through the Mining and Scientific Press Patent Agency, a gold-saving apparatus, which consists of a series of inclined closed boxes, the lower end of the first being connected with a vertical chute or feed-pipe, through which the material is delivered, and its upper end with the foot of the next inclined one, and so on to the discharge end.

The material is placed in a chute or hopper of considerable hight, the pulp being of a suitable consistency to flow readily. A series of inclined chutes or boxes, closed at the top, bottom and sides, so as to make a passage within them, which may be lined upon one or more sides with amalgamated plates. The upper end of the first inclined chamber is connected with the foot of the next by a nearly or quite vertical passage, so that the pulp, after flowing up the first passage, drops down into this passage, and there from the foot of the second chute it passes to the upper end, dropping again through another vertical passage, and passing up the third chute in the same manner, and so on until it may have passed over as many amalgamating plates as may be considered necessary to separate the gold.

In the bottom of each of the chutes is placed a mercury bath, through which the pulp is forced, and in the inclined side of the front chute is let a window or light, through which the churning of the quicksilver may be observed, thus admitting of a suitable regulation of the flow of pulp. A water-pipe is let into the end of the feed chute, to supply any additional necessary water and to regulate the flow.

In order to provide an adjustment by which the depth of the passage may be varied to suit circumstances, the upper or covering plate fits down between the two side-boards of the chute, and rests upon elastic strips, which extend along the sides raised upon the bottom plate. Clamps pass around the chutes, the upper portions forming staples, which pass through the transverse bar below, and have nuts by which they may be pressed down, thus pressing upon the top board or plate of the chute, and forcing it down, pressing the rubber strips so as to at the same time form a perfectly tight joint and allow of the adjustment. This adjustment enables the user to make the passage larger or smaller, to accommodate the pulp or material which may be flowing through, and relieve it if there be any tendency to clog or choke. The apparatus is practically a closed hydraulic sluice.

The bullion, ore and lead shipments out of Utah for the week ending Saturday, November 1st, were 39 cars of bullion, 985,451 pounds; 5 cars of ore, 151,100 pounds, and 5 cars of lead, 111,125 pounds.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS

Utah Territory.

A Brief Description of Some of its Leading Cities and Mining Properties.

[From Our Special Correspondent.]

Utah was orgauized as a Territory in the year 1850, its population at that time being a little less that 12,000. The first recorded settlement was by a party of 140 men, in Salt Lake Valley, in 1847. These were Mormons, and they came as the advance guard, so to speak, of the colony which followed. After a wearisome journey over barren plains and through rough mountain defiles, they could well have imagined, as they reached some cliff of the Wasatch range of mountains overlooking the Great Salt Lake basin, that they had really spied out the

"Promised Land"

For their peculiar people. The valley spoken of is undoubtedly the garden spot of a vast region of country, the natural nucleus of the populous Territory which has sprung into growth since those early years. Utah lies between the 37th and 42d degrees of north latitude and the 109th and 114th meridians of west longitude. It is, therefore, a square Territory, with an area of something over 87,000 square miles. Some 3,000 square miles of this are covered by water, by far the greater proportion of which is embraced within the confines of Great Salt Lake. There is one considerable desert within the Territory, and in fact the western third of Utah is said to be mountain, desert, sink and salt lake, with only a few oases of grazing or of possible arable land. The

Agricultural Land

Lies entirely in the valleys of stream or lake, and it must have irrigation for successful cultivation, as the rainfall of the Territory is so slight that crops cannot be brought to perfection without artificial watering. There is much grazing land on the slopes of the mountains, which, in years to come, will be more fully utilized than at present for stock-raising purposes. The bulk of the population in the Territory occupy its most desirable fertile regions, and these are included in a comparatively narrow strip running through the western-middle portion, from the Idaho line on the north to Juah county on the south, hardly more than one half the way to the Arizona line. Within this belt are the

Four Most Populous Cities

Of the Territory, Logan, Ogden, Salt Lake City, and Provo, which together coutain at least one-fifth of the entire population of Utah, seven of the principal counties within or hordering on the strip in question, contain nearly double the population of the remaining 20 counties. The total population of the Territory is probably about 50,000. The same seven counties spoken of, produced in 1880 at least three-fifths of all the cereals grown, upon that proportion of cultivated arable land. Thus the agricultural and commercial interests of Utah are considerably "bunched," and if it were desired to encompass the bulk of her people, the bounds would not include a greater area than that of many of the small and thickly populated Eastern States of our Union.

The Climate

Of this populous region of the Territory is, in the main, agreeable and healthful. As before indicated, the annual rainfall is slight, rarely exceeding (including snowfall) 16 to 18 inches. Four-fifths of this precipitation is during the six months beginning with December. So that the summers are dry and hot. But the nights are said to be cool, and there is an electrical quality in the atmosphere which renders it pleasant. The temperature within the region named does not vary as greatly as in other middle regions of the United States. The thermometer scarcely ever indicates a degree of cold greater than five below zero, or of heat above 100 degrees, while the mean temperature for the last twenty years has been 51.54, with a range from coldest to hottest of a little more than 90 degrees. This indicates an enjoyable temperature during most of the year. Upon mountain heights or broad expanses of sterile land there is, of course, greater extremes of heat or cold. Besides the barren regions of desert spoken of in the first part of this letter, Utah has its share of

Mountainous Land.

The Wasatch range runs across it from north to south, and its heights are bold and precipitous on the western slope. East of this range the Territory is mainly mountainous, and holds the snows and catches the rains which feed the great Green and Colorado rivers. The Oquirrh mountains run from the head of Salt Lake southward, until they are lost in other broken ranges which course through the southwestern part of the Territory. It is within the bosom of the Wasatch and Oquirrh mountains where lie the

Mineral Resources of Utah.

Many veins of rich quartz have already been exposed, but there is little doubt but that many more are yet hidden, which shall in the near future be sought out by the pick and shovel of the prospector. The correspondent of the PRESS has visited several of the leading mining districts of the Territory, and of them he will speak in the order in which those visits were made. To speak generally, he would say that he found them full of promise, and containing a people rich in faith as to the mineral wealth of their localities, which faith seemed based upon researches and prospects made by experienced and intelligent observers. There is now prevalent what may be looked upon as a temporary lull in mining excitement and development throughout the Territory. But we are sure it is not because of any discovered element of barrenness in Utah's ores. It is explainable, we think, upon the ground of a few mismanagements of large extent in mining properties, together with a social and commercial condition that is quite exceptional. In plain words, until

The Mormon Problem

Is settled, there will be considerable hesitancy on the part of capital to look toward Utah for investment. The recent action of Congress has stirred the matter up—unquestionably for the ultimate moral and commercial health of the body politic—and things will probably remain at a standstill until a quietus is given by more decided and thorough enactments. But it is not our purpose to discuss Utah within the realm of politics, and we only make these adversions because of their bearing upon the material well-being of the Territory.

We entered the Territory by way of the Utah & Northern R. R., from Montana. This railroad traverses a mountainous region during much of its route, the exceptions being the sage plains in Southern Montana, the lava regions of Snake river, and the fertile valley of Bear river, where is noticed agricultural improvements which extend far south into Utah. Our first stopping-place in Utah was at

Ogden.

As nearly everyone knows, this city is the locus of the connection between the Union and the Central Pacific Railroads. It is also the terminus of the narrow-gauge Denver & Rio Grande R. R., which runs side by side with the broad-gauge Utah Central R. R. from Ogden to Provo, some 85 miles, where the former branches off to the east, through the Wasatch mountains, and the latter continues south and southwesterly to Frisco, in Beaver Co., nearly 200 miles beyond Provo. Thus Ogden is the terminus of four railroads. But, strange to say, it contains no railroad shops of any importance, the repair shops of the Central Pacific R. R. Co. being the most extensive of any. But it is naturally the converging point of much travel, which is of some advantage in a transient way. The city was very active for a few years, during the construction of the D. & R. G. Road and the Oregon Short Line, but cessation of work upon these has caused a slight retrogression in business. Still, the city has a considerable wholesale trade with out-lying or tributary points, and but for Eastern competition, which is naturally favored by the railroad companies, it would reap the benefits which its position and connections easily give it. Ogden has several home industries of some magnitude. There are three grist mills, which are kept busy upon grain that comes to them, and two or three foundries, one of the latter being the property of Petersen, Wilson & Halgreu. These gentlemen are all practical workmen in their line, and it pleased us to see the prospects of a growing business for them. They already employ five or six men, and besides doing a large amount of casting and repairing, manufacture the Curtis pump, which is well spoken of. There are several large agricultural implement houses in Ogden, and Cache and Weber counties are a good market for these machines. There is also a large woolen mill here, running 350 spindles. The post-office of this city, under the charge of Captain Littlefield, is one of the best arranged and most tasty depositories of this kind that there is in the country. It has the Yale Lock Co.'s excellent lock boxes, arranged in a semi-circle, with money order and registry departments at one side. The site of Ogden is attractive, with the bold, brown Wasatch mountains to the east, towering up nearly 5,000 feet. The Weber and the Ogden rivers unite close to the town, and either stream flows through a canyon of great natural beauty, which might well be the resort of tourists, as game and fish are abundant. The population of the city is probably six or seven thousand, it being second to Salt Lake City among Utah's populous burghs. By means of a canal constructed upon the "bench," at the east side of the city, water is distributed in running streams through the streets, which adds to the attractiveness of the town. Although Ogden is suffering a slight relapse, as indicated above, we found here a city which surpassed our expectations, and one which seems to have all the natural advantages for an extensive entrepot and point of trade. This she is destined to become, if railroad and other business matters are adjusted to their reasonable conditions.

Salt Lake City.

It is 37 miles from Ogden to Utah's capital and metropolis. At our first entrance we were charmed with the broad streets, lined in the resident parts with shade trees in autumn-hued dress, and with rills of water coursing their ways close to the curbs on either side. The sky was fair as that which we read of in Italy, and the glare of summer's sun was tempered by a haze, which is only noticeable as one looks at the great orb, when it seems encircled by a broad halo of luminous atmosphere. There seemed a mellowness in the air and scenery, which we could not explain, but with which we were impressed. After a visit of two weeks, the sunshiny days seem equally rich and pleasant, and we continue charmed with Salt Lake's autumn climate.

The streets and blocks of the city are exceptionally broad and large, and the building lots proportional. So for business and resident portions to accommodate a city of 25,000 people, the dimensions spread out to an area of 12 square miles. The water rills which flow through most of the streets come from a canal, which taps the Jordan river far up the valley. This canal also supplies water for irrigation purposes along its route. There are also smaller water supplies for the city in the shape of mountain streams, which furnish the water needed for household purposes. There are said to be 13 miles of main water pipe in the city, which does not include, of course, the open rivulets before alluded to. With the exception of an elevated "bench" in the northwestern portion of the city, the site is upon a level plain, which extends out into the valley of Great Salt Lake. This lake itself is some 12 miles distant. It is a great bathing and pleasure resort in the summer season. The water is said to contain 20 per cent of salt in perfect solution, so that floating and swimming in its depths is easy and delightful. The mountains to the east of the city lend a charm to the landscape. The roads through and about the city are kept in good condition, and riding is a fine pastime for those whose tastes incline in that direction. There is a considerable concentration of capital and business interests in Salt Lake City. The Mormon Church has its headquarters here, with a temple (in process of erection), a tabernacle, tithing houses, co-operative establishments and residences for church dignitaries. A great many mining interests also center here, the main offices for all of Utah's principal mines, and many of Idaho's mines, being here. The region round about, as before indicated in this letter, is rich in agricultural resources, and there is a thorough tillage of the soil, with irrigating appliances. The Utah Central R. R. Co. has its shops here, and the other railroad companies of the Territory have main offices. There are several iron foundries and machine shops, and a few extensive planing mills. All of these things contribute to the thrift and bustle of the city. But at present there cannot be said to exist any unwonted activity. Business is holding its own, and there seems to be a settling down to present conditions, without the feverishness of rapid growth. In an industrial way, one of the most interesting institutions of the city is the Salt Lake Mining Institute, under charge of the skillful and intelligent mining engineer, Prof. J. E. Clayton. The institute includes the exhibit made by Utah at the Denver Exposition a few years ago, besides the private collection of minerals belonging to Prof. Clayton and other parties. It is one of the best representative collection of Pacific Coast minerals that we have ever seen. There are few better informed mining experts or scientific men on the coast than Prof. Clayton, and we were pleased to receive an assurance from him that he would in future favor the PRESS with occasional contributions.

Utah's Smelters.

South of Salt Lake City, from seven to fourteen miles, are the great smelters of the Territory, to which many of the ores mined in distant parts, both of Utah, Idaho and Montana, come for reduction. By a local writer, Sandy, farthest south of all, has been called the Swansea of Utah, but since the cessation of work at two smelters there, this would seem to be an extravagant appellation; but the entire region we have just included may well take that name. The Utah Central and the Denver & Rio Grande railroads each run tracks to the smelters, so that these institutions have some advantage from railroad competition. But they complain that there is such discrimination in freight rates by the different railroad companies in Utah, that Eastern smelters in Omaha, Kansas City and Denver are given undue advantage in the competition for the ores in this western market. But, he that as it may, it is certain that mine-owners derive an advantage from the competition of the smelters about Salt Lake. There are three which run entirely on custom ores, and each is stimulated to give the highest price permissible, in order to get the business. The first of these smelters south of Salt Lake City is the

Morgan Smelter.

It is six miles from the city. It runs two stacks, or blast furnaces, and reduces thirty tons of ore per day in each stack, but handles from 100 to 125 tons of ore and fluxing material within that time. It buys its ore in the market. At present it is running mainly upon ores from Bingham, in the West Mountain Mining District, Utah. About 100 workmen are employed at the Morgan. Its power for running two blasts for furnaces, a crusher, an elevator for raising and lowering ore cars, and a fire pump, is supplied by water taken from the farmers' canal, which runs through the grounds. For lease of ground and use of water, the company pay a pioneer farmer $300 per month, which is better for him than raising turnips and beets on this small patch of ground. R. H. Terhune is superintendent of the Morgan smelter. His brother, W. E. Terhune, is Assistant superintendent. The latter was in charge at the time of our visit, and he seemed to have a sharp eye to the management of all details of the business. The

Horn Silver Smelter

At Francklyn, a mile and a half south of the Morgan, is run entirely upon ore from the Horn Silver mine, at Frisco, some 245 miles south of Salt Lake City. The mine and smelter—both the property of one company—combine to make the most productive piece of mining property in the United States. The ore is heavily charged with lead (30 per cent.), and contains from 30 to 100 ounces of silver to the ton. The bullion produced is 95 per cent. lead. The ore carries, besides lead and silver, zinc, sulphur and copper, in variable quantities. The smelter handles the entire product of the mine—from 120 to 150 tons per day. The works are very extensive. There are five blast furnaces, from which an immense product of base bullion is taken each day. The bullion is not refined, but shipped in large bars to Chicago or other Eastern points, where the silver and other valuable metals are extracted. The cost of this plant was some $160,000. One hundred and seventy men are employed—all under the supervision of George Murray, superintendent. As this is one of the phenomenal mining properties of the country, we have secured from Harry J. Hill, the general superintendent of the company, a statement of the output for the last six months. It is not necessary to give the details. The average product per month has been 140,000 ounces of silver, and 875 tons of lead. The mine was given its present name from the fact that its surface croppings contained much horn silver.

Germania Lead Works.

A short distance from the Horn Silver smelter are the works of the Germania Company. It differs from the other smelters in having refining works, where the base bullion produced at the blast furnaces is reduced to its finer products of gold and silver, as well as lead. It obtains its ores from many sources, drawing quits largely upon Idaho mines, but of late receiving much from Park City, in the Unitah District, Utah. From 100 to 110 men are employed at the Germania. There are three stacks, which have a capacity of 50 to 60 tons each per day. T. S. Austin is the superintendent; P. S. Shearer, foreman of smelters, and J. P. Cahoon, foreman of the refinery.

Sandy.

Two years ago this was a very busy hamlet, with double or treble the number of workmen that are now employed. Two smelters lie idle, and are fast going to wreck, having been stopped for the reason that, with Eastern competition, there was not sufficient ore in the market to keep all supplied. Scott & Anderson, of Salt Lake City, have sampling works here, at which they work small lots of ore thoroughly, for the satisfaction of parties who desire a clearer idea of the working value of their ores than can be obtained from an assay. They employ ten men. But the most extensive plant in Sandy at present are the furnaces and works of the Mingo Furnace Co. Like the Germania and the Morgan, it is a custom smelter, and reduces about 50 tons of ore per day. It employs 70 to 75 men. It has four stacks, but at present only two are in operation; so that it is running to about one-half its capacity. Its bullion is purchased by the Pennsylvania Lead Co., of Pittsburgh. This bullion usually contains about 60 ounces of silver to the ton. At least 6,000 tons are produced during the year. Mr. John E. Knapp is superintendent of the Mingo.

Below Sandy there are two or three agricultural settlements in the Salt Lake valley, but the evening train of the Utah Central R. R. quickly takes us through these, and on into the Utah lake basin. As we leave the former valley, there is presented a magnificent view from the car window. Our train has circled around a curve in the valley boundary, and has gradually attained a considerable elevation upon the foothills, so that the passenger can look off to the north and west over a large scope of country. The Jordan river appears as a silver ribbon in the valley below, while numberless irrigating ditches are like threads running hither and thither. Few outlooks could be finer than this, of river, plain, and mountain, with a great inland sea in the dim distance, while with a turn of the head one can see in advance the mirror-like waters of Utah lake, with equally diversified scenery in that direction. Let no tourist who goes to Salt Lake City, miss such a ride as this upon the Utah Central.

The basin of Utah lake is fertile and quite thickly populated. It contains several small towns and the large city of

Provo.

The capital of Utah county. This is emphatically an agricultural city. Most of its homes are occupied by farmers, who own small farms adjacent to the town. Provo is one of the oldest settlements of Utah. Many of its yards contain fruit trees, which were at our visit laden with ripened fruit. There is also a profusion of shade trees, and as in Salt Lake and Ogden, little rivulets, flowing from a supply obtained from the Provo river, course through the streets. The population of the city is about 3,500 to 4,000. The Provo river, which flows through the outskirts of the town into Utah

(*Concluded on page 294.*)

MECHANICAL PROGRESS.

The Converter vs. the Crucible.

There is quite a lively discussion going on in England just now as to the past and present qualities of steel, or rather as to the relative merits of the Bessemer converter and the crucible for the production of the finer kinds of steel, as for edge tools, etc.

It is claimed by some that there has been a decided decadence in steel since the converter came into use. Others hold that the demands upon the makes of tool steel are far more severe now than they were 10 or 15 years ago that no steel maker, before the days of the converter, would ever have thought of being called upon to furnish a steel from which a turning tool might be made capable of turning a 6-foot-long bar of hard steel, 5 inches in diameter, down to five inches in diameter at one cut and with one grinding, the tool sliding one inch for sixteen revolutions.

The Discussion in the Iron and Steel Institute.

The question came up with an increased degree of fierceness during the late meeting of the Iron and Steel Institute at Chester. In the bitterness of the dispute, it was asserted that this meeting was held at Chester because it was shut out from Sheffield, the headquarters of the crucible steel manufacture. Sheffield's plea for shutting out is, that owing to the defective state of the English Patent Law, it is better that processes should be kept a secret, rather than be patented; as by widely throwing open gates heretofore for expert visitors at the meeting, Sheffield has suffered, and that hereafter the steel makers there propose to profit by experience.

Crucible Steel

Was first made by Huntsman, at Attercliffe, Sheffield, in 1773, and, with few exceptions, say the friends of the Bessemer process, is practically the same to-day as it was 111 years ago. Just as if science and metallurgy had never made one single advance. "Fancy," says a writer, "the steel melter going at 6 in the morning, putting his pots in the furnace, and getting 60 pounds out of the first round by 10:30, the second round of 40 pounds 4 hours later, and the third round of 36 pounds later still; total, 136 pounds per pot per day, and using 3 tons of coke, costing over 40 shillings, to get this result. How can this steel maker compete with rivals who are making steel with coal at a cost of 5 shillings per ton, and get out twice the weight? The barbarous, old-fashioned process of making steel in crucibles will soon be extinct."

Crucible Steel Still on the Increase.

In reply to the above and similar statements, those who still adhere to the time honored crucible method assert that the manufacture of crucible steel is considerably on the increase, and that it will be more and more so as the manufacture of Bessemer and Siemens' Martin steel increases. It is claimed that the three methods have never worked antagonistically "except in the mind of Sir Henry Bessemer himself." As proof of the increase of the use of crucible steel, it is stated that the importation of the higher grade of Swedish bar iron has largely increased of late, and that the importation is mainly converted by the crucible process into steel.

As further proof of the fact that the crucible is indispensable, the fact is referred to that while the best Bessemer steel can be bought for $25 to $30 per ton, crucible steel of the best quality for tools, made from high class Swedish iron is worth $250 per ton.

The Intricacies of Crucible Steel Making.

It is held that when crucible steel is required for the thousand and one purposes for which it is applied, its manufacture is no child's play, and is not learned in a month, nor a year—not fully in a lifetime even.

Sir Henry Bessemer's Statement.

During the discussions at the Chester meeting, it was affirmed that Sir Henry stated when he started his works that he did not propose to produce an article of steel for $30 per ton to compete with one costing $300 or more per ton. What he did attempt was to make cast steel from English pig iron, which should be equal to the steel selling at that time in Sheffield for $200 per ton, and he succeeded in doing it. He made last year of that quality of steel from English pig iron, over one million tons, and sold the same at from $23 to $26 per ton.

High Class Bessemer Steel.

He also produced, by his patented process—using Swedish pig iron costing $30 per ton, instead of Swedish bar iron costing $125 per ton—bar steel, which he sold for $210, which has been manufactured into cutlery and other cutting tools of the very best quality. The friends of Sir Henry still appear to think that crucible steel will eventually be entirely superseded by that from the converter.

The London Times on the Discussion.

The London *Times* says, in reference to this discussion, that there appears to be a tendency among the manufacturers of crucible steel to exhibit a spirit, perhaps not of antagonism to science, but at least of disinclination to follow her teachings and follow her methods. The *Times* ridicules the attempt to secure secrecy as almost puerile, and tells the Sheffield manufacturers that the sooner they abandon that idea, the sooner they will be at liberty to apply their minds to matters of greater moment. It thinks the Sheffield manufacturers have come very poorly out of the contest between the advocates of steel making by ancient and by modern processes.

Compressing Fluid Steel.

Mr. T. E. Vickers, of the firm of Vickers, Sons & Co., of Sheffield, has been interviewed by a Sheffield reporter respecting the compression of fluid steel. Mr. Vickers stated that, having seen a machine for compressing fluid steel at Vienna in 1862, his firm commenced the construction of a similar machine, but it was not completed because it was then thought that there was not sufficient work for it. Of late years the weight of forgings has increased, and now the forging press is being completed. Messrs. Vickers can cast ingots up to 80 tons weight, but they have difficulty of forging beyond 50 tons. The press will deal with the heaviest ingots.

Mr. Vickers is reported to have said, *apropos* of the Iron and Steel Institute, that he objected to educate trade rivals; gentlemen like the American Commission, and not conversant with the trade, could not possibly do harm, as they could appreciate results only, and not the means by which those results had been attained. The late Mr. Holley was a valuable personal friend of Messrs. Vickers, and called whenever he visited this country. For the last 15 years he good-naturedly and loyally accepted and appreciated their objection to assist him in training competitors, and never went further than the office and the lunch-room. Mr. Vickers further stated that he had attended very few of the excursions of the Iron and Steel Institute, because he did not think it would be fair to go into the works of rivals, whose presence in his own works would be objectionable to him.—*English Paper.*

Rawhide Gearing and Friction Pulleys.

"In 1860, just before the war," says a writer in the *Scientific American*, "I was employed to start a manufactory, one of the exactions being the construction of a machine for drawing and flattening fine brass wire. The connections of parts were first made by pulleys and belts—they did not hold; gears of necessarily very fine cogs broke their teeth; some were made of steel and hardened, but did not stand. The requisite appeared to be resistance and toughness of material. Rawhide was suggested, and some gears made of that material did their work well. Since then the use of this material has been noticed under similar conditions. Lately hydraulic compressed rawhide has been favorably mentioned as material for friction rolls and pulleys, for skake rolls, and as facings for friction wheels. There is no question of its advantage as a material for small pinion gears where much strain comes on each tooth; if not exposed to the continuous action of oil—animal oil especially—these wheels will bear a deal of rough usage. One of the useful qualities of rawhide is its yielding to a shock or sudden strain without breaking and without giving a permanent backlash. Steel and the best of Norway iron will break under strains to which compressed rawhide will only slightly and temporarily yield. The teeth of rawhide blanks can be cut in the gear cutting engine as well as those of iron or steel, and the material can be more readily turned in the lathe. If a lubricant is required in the working, clear water is the best.

SOLDERING CAST IRON.—There are cases, says the *Scientific American*, where brass requires to be united to cast iron, and drilling and riveting would either make a clumsy job or would weaken the parts. Soldering, if effective, is incomparably the better way. By many mechanics it is supposed to be either a trade secret or a skillful trick to make solder adhere to cast iron, but it is not so. The process differs but slightly from soldering on an already tinned surface, as sheet tin.

If the cast iron is white iron, or a thin casting that has been chilled in the casting—iron not amenable to the file—it should be cleaned from surface impurities by scraping or scouring, and washing in potash water. Then dip it for an instant in clear water, and wash it quickly with undiluted muriatic acid of the ordinary commercial strength. Go over it at once with powdered rosin, and solder with the soldering iron, before the surface has had time to dry.

Another plan, and a better one especially for soft gray iron castings, is to file the surface clean, wash as before, wipe it over with a flux made of sheet zinc dissolved in muriatic acid until it is surcharged, or is a saturated solution, and has been diluted with its own quantity of water. Then sprinkle powdered sal ammoniac on it, and heat it over a charcoal or clear hard coal fire until the sal ammoniac smokes. Dip at once into melted tin, remove, and rap off the surplus tin.

LOCOMOTIVES.—If all the locomotives in the United States were placed in line, they would make a line over 200 miles long, worth about $192,000,000, instead of $30,000,000, as most of our exchanges have put it. There are about 24,000 locomotives now in use in this country, which, moreover, multiplied by 8,000, will give the larger figure, which is approximately correct.

SCIENTIFIC PROGRESS.

The Great Electrical Problem.

The great electrical problem which is now exercising the minds of scientists and inventors, is to discover some method of obtaining electricity direct from the combustion of coal, instead of having to get it by the expensive and roundabout way of first producing heat, then by that heat producing steam power, and finally developing electricity by the use of that steam power. This, it is apparent, is a very indirect and expensive method of work.

Mr. Edison, being recently interrogated in regard to this matter, said: "I have been working away at it for some months, and have got to the point where an apparently insurmountable obstacle confronts me. Working at the problem now seems to be very much like driving a ship straight for the face of a precipice, and when you come to grief, picking yourself up and trying it again to-morrow. There is an opening in the barrier somewhere, and some lucky man will find it. I have got far enough to know that the thing is possible. I can get quite a current now directly from the combustion of fuel. Jablochkoff tried his hand at the same thing some years ago, and so did some Germans, but the results were laboratory curiosities only.

"I give myself five years to work at it, and shall think myself lucky if I succeed in that time. The unscientific world has no conception of what such a discovery would mean. It would put an end to boilers and steam engines; it would make power about one-tenth as cheap as it is now; it would enable a steamship to cross the Atlantic at a nominal cost; it would enable every poor man to run his own carriage. It would revolutionize the industrial world."

There is certainly no finality to human invention, and there is no known scientific reason why we may not obtain the desired result as above indicated. The marvelous discoveries and wonderful applications of electricity which have so pre-eminently distinguished the present generation, give us good occasion to believe that with more experience and study and more light, the next generation will give the world still greater marvels in this comparatively new and interesting science. It may be, that even before another decade shall have passed, electricity will be found superseding steam, and the huge boiler of to-day be cast aside as the clumsy expedient of an ignorant generation.

A DEVOTEE TO SCIENCE.—The Warsaw *Courier* publishes a letter from a subscriber, in which the writer offers himself as a subject to be experimented upon in reference to cholera. "I am unmarried," says he. "I have no ties of any kind, and no plans for the future. I therefore wish to be of use to humanity by undergoing any experiments which have not yet been tried upon human beings. I seek no reward, but should require to be paid my traveling expenses to wherever I might have to go to be experimented upon and those of my return to Warsaw, should I be spared to perform it. I may add that I am 24 years of age and in good health." The writer says that communications in answer to this may be sent to "Z. A. K." care of K. Tsihulski, china and glass dealer, Theatre-place, Warsaw.

OXYGEN IN IRON.—Recent investigations, says Mr. I. Lowthian Bell, have led chemists to ascribe, among other causes, the want of malleability—or red shortness, as it is termed—in heated iron to the presence of oxygen gas in some form or another. Three specimens made at the Monkbridge Works, one of them red-short, were recently sent to me for examination, and their composition entirely confirmed the soundness of this opinion. On analysis, the two samples that were free from this defect contained only 0·750 and 0·704 per cent respectively of oxygen, while the one complained of gave 1·384 per cent.

FOR A POWERFUL MAGNET, Sig. B. Ricco, of Palermo, rolls a long band of sheet iron around a nucleus of soft iron, insulating the different layers of the band by oiled paper. One pole is connected with the nucleus, to which the interior extremity of the band is soldered, and the other is connected with its exterior extremity. The current, in traversing the band, magnetizes not only the nucleus, but also each layer of the band, which thus is both conductor and magnetic substance, thereby condensing the lines of force, and producing a great concentration of power.

TELEGRAPHING AND TELEPHONING SIMULTANEOUSLY.—It is reported that Van Rysselberghe, in Belgium, has solved the problem of transmitting a telegraphic and a telephonic message along the same wire at the same time. A trial of this has been made at the Antwerp Universal Exhibition, where concerts held in important towns in Belgium were heard; the transmission being made with ordinary instruments along ordinary telegraph lines and with earth returns.

SPINEL CRYSTALS.—M. Munier claims in *Comptes Rendres* to have produced spinel crystals, and thinks he has also produced periclase and corundum by the action of them an aluminum chloride, at a red heat, in presence of magnesium.

A Heat Giving Compound.

For the last two years experiments have been making toward the warming of cars by means of a heat-giving liquid, which, when once warmed, continues for several hours to throw out heat with approximate regularity for a time depending upon the original degree of heat imparted to the liquid. The cars of the DeKalb avenue line, in Brooklyn, seventy in number, have been heated by this system during the last winter to the satisfaction of the company, and presumably to that of the public.

A large iron pipe containing the compound passes under each seat of the car; through the center of the pipe runs a smaller pipe through which steam is passed when it is desired to heat the compound. When heat is applied to the pipes from a steam boiler in the station, the crystals in the acetate of soda used are liquified, and remain so until the temperature begins to fall perceptibly. Then the crystals begin to form and the liquid throws out an increased heat. A thermometer taking the temperature of a pipe of the heated compound, shows that during the first hour or two there is a slight fall of temperature, then a sharp rise while crystallization takes place, and then a gradual fall.

A record of the temperature of one car kept during twenty days, showed that after each run of sixteen miles, the temperature in the car was upon an average less than one degree lower when the car returned to the station than when it started out. The cost of heating cars by this system is said, by the company which controls the patents, to be no more than for stoves, while the heat is pleasanter and the atmosphere is free from gas and smoke. The compound in the pipes will last for an indefinite number of years for all that is known to the contrary, being hermetically sealed.

This company now propose to introduce the same system as an improvement on heating by ordinary steam radiation. Steam coils often heat too violently in small rooms, and either give too little or too much heat. By using the steam to heat a reservoir of the compound liquid, the steam can be turned off when the room is sufficiently warm, and the reservoir will continue to throw out a constant amount of warmth for several hours. A small pipe, full of the compound, 3 feet long and 4 inches in diameter, is made for heating private carriages.

LIGHTNING IN MINIATURE.—A correspondent of the *Scientific American*, gives a description of an interesting exhibition which may be made by the use of an induction coil. In giving a lecture he desired to make as long a spark as possible, but his coil produced one of but four and a half inches. After numerous experiments he finally adopted the very successful method: Fasten dry boards together making a plane surface three by four feet. Varnish one side, and before it is dry, press upon its entire surface, sheets of tin foil. Allow it to dry slightly over night, and then with a sharp knife and a ruler draw parallel lines across the foil one eighth to one quarter inch apart. After allowing it to dry again a short time, pass the knife across again at right angles to the former lines, dividing the surface into squares which will be separated only by the thickness of the knife edge. Now connect the poles of the coil to opposite ends of the board, and an effect of dazzling beauty will be produced. At every break of the circuit numerous flashes of miniature lightning will dart across the board, making a brilliant display in a dark room. By connecting a small condenser between the poles, the electricity instead of dividing into devious paths will be concentrated into one single intense stroke directly across the board. An induction coil of much less power would in this manner give very satisfactory results.

THE USE OF COLORS was certainly known to the Americans from the most remote antiquity. The ochres, soot-black, and lime, doubtless furnished them their first coloring elements, and there was nothing in the idea of using these pigments above the most primitive conceptions. Experiment induced a rapid progress, and men learned to extract vegetable colors from leaves, fruits, roots, stems and seeds. A coloring matter was also borrowed, like the Tyrian purple, from sea-mollusks. The Peruvians and the Mexicans knew how to place the colors upon their cloths. The goods were then exposed to the action of the light, and tints varying from a delicate rose-color to a dark violet were obtained. The colors were so well fixed that they were not even modified by the decomposition of dead bodies. In the collection of cloths from the Peruvian *huacas* at the museum of the Trocadero, in Paris, wrappings of mummies that have been buried for centuries still retain their primitive color on their time-eaten threads.

PURE PLATINUM is as soft as silver, but by the addition of iridum it becomes the hardest of metals. The great difficulty in manipulating platinum is its successful resistance to heat. A temperature that will make steel run like water and melt down fire clay, has absolutely no effect upon it. You may put a piece of platinum wire not thicker than human hair into a blast furnace where ingots of steel are melting down all around it, and the bit of wire will come out as absolutely unchanged as if it had been in an ice box all the time.—*Ex.*

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SAN FRANCISCO:
Saturday Morning, Nov. 8, 1884.

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Passing Events.

The attention of the whole country during the past week has been directed toward political matters to the exclusion of industrial and business affairs. In fact, for some time past, trade circles have been very quiet. Now that the election contest is over, business men hope for a general improvement and a change from the prevailing stagnation.

The mining interests of the country have been more or less neglected of late, although the mines are of course being constantly worked. Still there is little news of an interesting nature to be gained. The deep ground now being explored on the Comstock is watched by mining men with expectancy, since the deepest workings in the world are being carried on. Should good mineral deposits be developed, the result will be a general revival all along the lode, for there will be work for most of the mines.

The news from the new camp in the Little Rockies, Montana, is not of an encouraging nature, and it looks as if first accounts, as usual in such cases, had been somewhat rose-colored.

MINING ABOUT AUSTIN.—While there is never anything like a big mining boom at Austin, Nev., at any time, it is nevertheless one of the steadiest mining sections of Nevada, sending forth a fair share of bullion in one continuous stream. The Manhattan mine, for instance, from 3,624½ tons of ore reduced in the months of January, February, May, June, July, August and September, produced $810,599.23 in bullion. In 1883 this mine from 6,084½ tons of ore of an average assay value of $205.57 turned out $1,182,086.58 in bullion.

Locating Claims of Building Stone.

A question came up recently before the Commissioner of the General Land Office, as to whether a man could take up a deposit of building rock as a "placer." A man located what he called a placer claim and applied for a patent on the ground. When he applied to purchase his land, the Register declined to allow the entry because he was "in doubt as to whether the character of the ground is such as to make it subject to pre-emption under the laws relating to placer claims."

In his application for patent the applicant claimed the land as a "deposit of valuable building rock." The Register reports that "it is evidently not agricultural land, and there appears to be no lode claim within it or in its vicinity." Also that he has taken some pains to investigate its character in an informal way, and is satisfied that it is valuable only for the building stone that it contains. Deputy Mineral Surveyor Edwin H. Kellogg, in his report approved by the Surveyor General on November 23, 1883, says: "The quality of the land I would define as alluvial deposit heavily mixed with water-worn boulders, is the portion lying next the west boundary and about 200 feet wide. The portion lying south of the foot of mountain noted, is made up of heavy ridges of gravelly soil, with rocky streaks through it. The remainder is covered by a high cliff of granite rocks and its fallen debris. There are not within the boundaries, or in the immediate neighborhood, any lode claims or system of lodes." The value of the claim seems to be entirely in the quarry in the face of the cliff, upon which the applicant has expended, in work and improvements, not less than five hundred dollars.

Section 2319 Revised Statutes, declares all valuable mineral deposits in lands belonging to the United States and the lands in which such deposits are found, to be free and open to exploration, occupation and purchase by citizens of the United States and those who have declared their intention to become such. Section 2329 provides for the entry and patent of "claims usually called placers, including all forms of deposit, excepting veins of quartz or other rock in place."

In this case as the land was shown to contain valuable mineral deposits, but *no* veins of quartz or other rock in place, the Commissioner gives an official opinion that the entry may be allowed as a placer claim. He therefore so instructed the Register and Receiver.

Utah Mines.

There is no part of the United States at present, which has more productive mines than some of those of Utah Territory. Several of her mines are wonderful bullion producers, as our weekly account of bullion shipments indicate. The Horn Silver, Ontario, Hanauer, Christy, and a number of others send in their thousands every day. On the 1st inst. the Ontario company paid its round 100th dividend in New York, being 50 cents a share, $75,000. Total dividends this year, $750,000; total to date, $5,900,000. The Horn Silver mine is one of the greatest in the world, the amount of bullion it is producing being wonderful, even in a rich bullion producing region.

Salt Lake has become a great ore market. During the week ending on the 1st inst., the following shipments of bullion, ore and lead were made out of Utah: Twenty-two cars of bullion, 553,023 pounds; 5 cars of ore, 151,100 pounds; 2 cars of common lead, 48,653 pounds, and 3 cars of white lead, 62,472 pounds. Total, 32 cars, 815,248 pounds.

For a long time the Utah mines were under a cloud, owing to early extravagances, but the season of depression has long since passed, and the mining industry is as prosperous there as in any of the Pacific Coast States or Territories. The letter of our special correspondent, which is published in another column of the PRESS this week, gives many interesting facts concerning Utah's mining industry, and further information on the subject from the same source will appear next week.

THE mines of Summit Valley District, says the Butte *Miner* of Nov. 1st, will make the boss showing at the World's Fair. Commissioner Read is receiving samples daily, the Bell and the Alice getting to the front yesterday.

Salt on the Pacific Coast.

The consumption of salt on the Pacific Coast, by reason of the many uses into which it enters, has always been very large. It is employed in a variety of industries, all having considerable, and some of them very large, requirements. In the reduction of silver ores, and other metallurgical operations, between 20,000 and 30,000 tons of salt are disposed of every year. In dairying and meat-packing, and for culinary and other domestic purposes, and for curing hides, fish, etc., a great deal is used. In various manufactures and in the economic arts some is also needed, the consumption in the Pacific States and Territories being exceptionally large for their population.

Moreover, of all the useful minerals found on this coast, none occur in such abundance and wide distribution as salt. Besides numerous salt springs, ponds and lakes, this mineral exists in crystallized layers interstratified with other substances, the whole forming great mountain-like masses, and in deposits occupying the beds of dry or nearly dry lakes, on wide, extended marshes, alkali flats, etc.

Besides the product of these natural salines, large quantities of salt are made by the solar evaporation of sea-water, not less than 50,000,000 pounds being produced by the process on the bay of San Francisco every year. The plan of producing salt by boiling in kettles or evaporating the brine in shallow pans by means of artificial heat, the common method in most countries, and used extensively in other parts of the United States, is not practiced here. Our long, rainless summer, with large proportion of sunny days, are very favorable to the manufacture of salt from sea-water. The traveler passing along in the railroad cars in the vicinity of Alvarado and thereabouts, on the Eastern shore of the bay, will see great heaps and piles of salt, looking like huge tents, scattered all over the marshes. These are all the product of the bay salt factories. The evaporating reservoirs of the companies cover hundreds of acres.

Losses in Smelting.

In roasting, as well as smelting lead ores, there are certain losses which cannot be avoided entirely, but which may be reduced to a minimum. In roasting an ore it first experiences a loss in weight owing to chemical reaction taking place; it loses water and carbonic acid; sulphides of metals are converted into oxides, and thereby decrease in weight. If the roasted ore will then show more silver by assay than the crude ore, this would prove that no loss of silver had taken place. If roasting is carefully conducted, the loss of silver by volatilization should not be over three per cent; but antimony, arsenic and zinc, cause a much higher loss by carrying off silver along with them to an extent which, if the temperature has been too high, may approach 20 per cent.

The losses in smelting are caused by the formation of speiss, matte and other by-products which are thrown away. Slag will also cause a slight loss in metals, even if of normal composition. Zinc blende will increase the loss in the slag materially. The loss by volatilization is very slight so far as the silver is concerned, and may be entirely avoided by having enough lead in the charge to "cover" the silver. It is, however, not known what exact minimal quantity of lead is required to "cover" a certain quantity of silver and prevent loss. Smelting in Leadville is said by Mr. Hahn to have proved the fallacy of Kerl's statement that 300 times the amount of lead is required to cover one unit of silver.

The volatilization of lead is very large when charges low in lead are smelted; as in Leadville where frequently charges containing only 7 per cent lead are treated. The loss of silver at Leadville is between 3 and 4 per cent, while the loss of lead from all sources amounts to from 13 to 15 per cent. At the Horn Silver works, in Utah, the loss of lead is stated at 8.71 per cent, but there they treat charges richer in lead.

ANY one looking for an investment in a gold mine will do well to read Mr. Chambers' offer, published in our advertising columns, in which he proposes to give a good interest in his mine to any person who will aid him in performing certain work on the claim. The mine is in a good gold-producing region, where there are rich mines now being worked.

Obtaining Patents.

A short time since an organization was perfected in this city, which a number of local inventors have joined, and in which the members are to assist each other in obtaining patents. When a member perfects an invention, and has not the means to procure his patents, the others are to help him pecuniarily, by some sort of assessment plan; and the member, moreover, submits his invention to the others, who are to criticise it and assist in its perfection. How the inventor is to take oath that he is the sole inventor, as the law requires, after such assistance, is not clearly explained. And whether those who have helped cannot come in and claim a share of profits, remains to be seen. The idea of inventors helping each other with money is a good one, if practicable; but it is hardly probable that those with plenty of means to get their own patents, will go where they have to show unpatented inventions to others; and those with no means to get their own patents, will hardly be in a position to help others.

A society of inventors, organized for mutual support and protection, and conducted for the benefit of inventors, would doubtless be of service to the class. But it should not have as an organizer and leading spirit, any individual with an unsavory record in the same line, and who is known to have been mixed up in rather shady transactions, which inured to his own benefit, and to the detriment of the inventor. It is so easy for an unprincipled man to push himself forward in such enterprises, that those who really have the welfare of such organizations at heart should be exceedingly careful.

A meeting of the society referred to in the first paragraph, was held recently, and from a report in a daily paper we take the following:

"W. Patterson discussed the methods employed by the various outside agents and patent bureaus, in obtaining patents for the inventors, and during the course of his remarks exposed the impositions practiced by such agencies upon the inventors. He explained it thus: An inventor takes his invention to a patent agency and pays his fees. The agency promises to look into the invention, and makes out the specification, which it sends to Washington, D. C. After it has heard from Washington, it acquaints the inventor with the decision, and represents that the Patent Office says the rights are clean, that no other invention covers his, and takes its final fee of $20. The inventor then takes his invention to the manufacturer, who, before he buys it, looks well into it, and discovers that the Washington office has made one or two objections to certain parts of the invention, and therefore he refuses to buy the invention. The inventor has been thus clean swindled out of $75, the price paid the patent bureau to get his patent.

"A. B. Smith then explained the objects of the institution, which were to protect inventors from such people; for the institution proposes to look into inventions and make out specifications itself, so as to insure each member from fraud, and the price charged for such specifications will be $65, or $10 less than any outside agency."

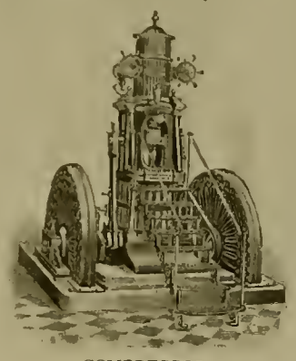
What Mr. Patterson calls the "impositions practiced by patent agencies on inventors," arise simply from the fact that the inventor thought he had invented something that a previous one had already patented. Therefore the Patent Office struck out such previously patented parts, allowing the inventor's claim only on those things which were new. How a patent agent or inventor can help that action is not plain.

The matter is susceptible of a very simple explanation. A man invents an apparatus or machine. He explains all the points to his patent agent, who, under his direction, prepares drawings, and a descriptive specification which explains details. At the end of the specification are placed certain claims, which form the "meat" of the patent. All the new features, and new combinations of parts to effect certain results, are subject to separate claims, each claim being numbered. When the papers reach the Patent Department, they are submitted to the Examiner of the class in which the invention belongs. This individual is an expert in that class, and has at hand all the drawings and specifications descriptive of every patent in that class, previously granted in the United States. He has also drawings and descriptions of all foreign patents, and all the

necessary books and references for a complete understanding of the special subject.

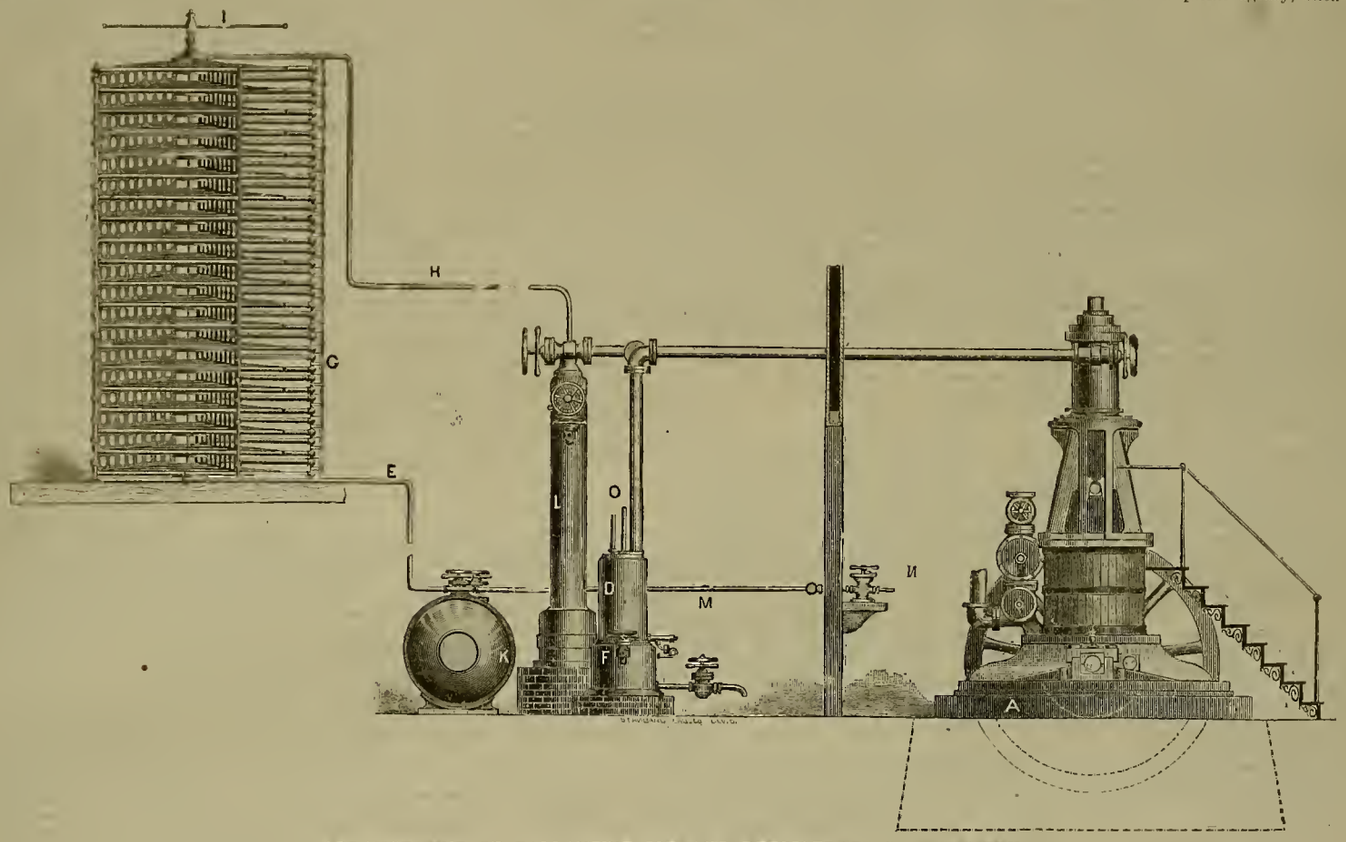
When the case referred to is taken up, the examiner looks carefully at all the points involved. He finds, for instance, that claim 2 for a certain combination, has been granted to another inventor in a similar machine several years before. He therefore rejects claim 2. He finds that claims 4, 5 and 6 have also been anticipated, and erases them. Claims 1, 3 and 7 he finds are new. He grants to the inventor therefore, what he has really invented, and which is covered in claims 1, 3 and 7. Those things which some one else had previously How the patent agent has swindled him out of $75 is not very clear. The inventor has obtained from the Government all to which he was entitled—all that he had invented. He could scarcely expect to get a claim on something some other man had already patented, even if he did have it in his apparatus or machine, and thought it was new.

The remark about protecting inventors from not wait for the manufactnrer to tell him what he has patented, as Mr. Patterson intimates, form of procedure in such cases. Any one knows that the government will not grant people patents for things already patented. Inventors full specifications and drawings, west of the Missouri river. How people can look into the patents without such facilities it is hard to say; and such preliminary examinations can only be cursory from the nature of the case. The cannot keep themselves posted on all the changing requirements of the Patent Department, maintain an agent in Washington to look out for their interests, keep draughtsmen, copyists, etc. The patent agency business is a legitimate one, and requires years of experience of experts in specification writing. Out of the $65 or $75 required to get a patent, the government takes $35, and the balance pays the specification writer, draughtsman, copyist, Washington agent, etc. The fees are by no means exorbitant.



COMPRESSOR.

It is just as well for the inventors of the country to look out for people who go into a new business and immediatoly begin to class all the others previously in the same business, as swindlers. Institutions which are organized to give something for nothing, are not generally successful except to a few people who know how to manipulate them in their own interests. Experience has proved this. A patent agency established under another name, is none the less a patent agency, when it en-

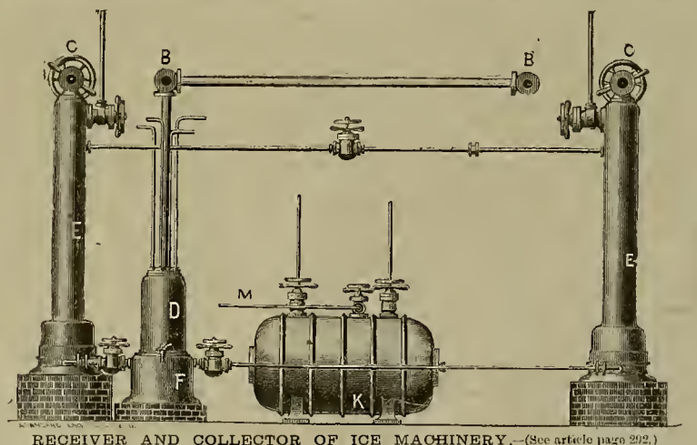


ARRANGEMENT OF BALLANTINE ICE AND REFRIGERATING MACHINERY.

such people is all bosh, for there is a certain invented he rejects. An official notice is sent to the agent of the inventor, detailing which claims are granted and which rejected. For each rejected claim he gives a reference: that is, he gives the number and date of the patents which show the devices claimed by the inventor, but already patented by others. When the patent is finally granted and issued, it contains only the three claims allowed. All the descriptive matter of its specification remains, for the sake of clearness, but no claims are allowed for parts of which the applicant was not the *first* inventor.

The final fee of $20, of which Mr. Patterson speaks, is demanded from the inventor when notice of allowance of the patent is forwarded to the agent, and by him to the inventor. It goes to the Government, not to the agent. If the inventor is not satified with the claims allowed, before paying the last $20 he has the privilege to appeal to a Board of Examiners, and from them to the Commissioner of Patents. If he can establish novelty in his claims, he can get them altered; otherwise not. The patent is issued if the $20 fee is sent on; and if the inventor thinks the claims allowed are not worth it, he keeps money in his pocket.

An inventor of any intelligence will naturally see before he sends his last fee, how his claims stand. His agent shows him the official letter, and he can judge of the strength of his patent before it issues. And when it has issued, he ought to know enough about it himself before he goes to a manufacturer to have it made, and



RECEIVER AND COLLECTOR OF ICE MACHINERY.—(See article page 292.)

really need more protection from pretended friends who try to pull the wool over their eyes, than from patent agents. And men who are going to look into inventions themselves and make out specifications for inventors expect to be paid for their trouble, no doubt, just as reputable patent agents expect to be paid for their services.

As to looking into patents before they are sent on, this is no more than any agency does when it has the facilities to do so. But a library is needed for this, and there is only one complete library of Patent Office Reports, with monthly reports now received from the Patent Office, and costing $10 each, are immense volumes. The last one received contained 3,467 pages—and this for *one month* only—having complete specifications and drawings. It would take more than a month to read this book. As to obtaining patents for $65, many are taken out for that price, and others cost as high as $80, depending on the work involved in preparing the drawings and papers.

If inventors could make out their own papers they would doubtless do it and save agents' expenses, but while most of them can invent, they gages to procure patents for inventors and charge a fee for it. That the fee is less than that charged by reputable agencies, conducted by experts in the business, is only an indication that people of inferior capacity will be employed, who will work for less pay. Every man who can write, cannot write a specification for the Patent Office. It requires peculiar knowledge and experience, as any inventor knows. Moreover, inventors are generally adverse to showing their inventions to irresponsible people, or even to friends before they are secured in their rights. And patent agencies which have a record of years of business life, are not apt to endanger their existence by the revelation of clients' secrets, or by any sharp practices of any kind. Inventors should inquire carefully into the character of the men, firms or organizations, before intrusting their secrets to people who are to transact their business for them.

MINERS' PAY ON THE COMSTOCK.—On the 3rd inst., the following mines paid off the amounts named: Utah, $2,977.50; Union shaft, $7,517; C. C. shaft and Consolidated California and Virginia, $7,703; Ophir, Mexican, Union Consolidated and Sierra Nevada, $20,611; Crown Point, 13,535.50; Belcher, $13,785; $9,956; Hale and Norcross, $10,055.25; Savage, $1,290.50; Best and Belcher and Gould and Curry, $9,791.50. The aggregate is $97,222.25, with a few mines yet to be heard from. These will bring the total up to a little over $100,000.

It is announced in England that Lieutenant Greely is going to England to publish his book,

Utah Territory.

(*Continued from page 290.*

lake, is a beautiful stream of mountain water, and furnishes abundance of water-power for the establishments which utilize it, while double the number could be easily supplied. Two good-sized grist mills are run by this means; also the Provo Woolen Mills, which require at least 80-horse power, which they obtain from two large turbine wheels. This would indicate an extensive establishment, and such those mills are. They are unequalled in the West, meaning by that the entire country west of the Mississippi river. We were shown through the factory by the accommodating secretary, J. R. Twelves, and were surprised and pleased at the extent and beauty of the work done. These mills employ about 130 workmen, many of them, of course, boys and girls. They run 3,120 spindles and 56 looms. The output per annum reaches the value of $150,000, which is handled mainly by the Co-operative Institution of Salt Lake City. The mills are usually closed down for at least two months in each year, on account of cold weather, which interferes with the easy working of the spindles and machinery. Some of the machinery illustrates the perfection to which automatic arrangements are brought in these latter days. More than 3,000 grandmothers of a former generation would fail to do as much or as good work as do the spindles of this factory, while the looms probably do more than could be accomplished by another 3,000. The wool for supplying the works is raised mostly in Utah, Emery and Juab counties. It cannot be said to be a fine article, but the cloth which is produced stands inspection well. We saw many elegant patterns of piece goods of fine finish, and some beautiful blankets and flannels. Reed Smoot, Esq., is superintendent of the factory. It is an excellsnt property, well managed, and lucrative to the stockholders.

The Vulcan Foundry and Machine Co. is one of the growing home industries of Provo. It is doing a good business, considering that it has but recently been established. It makes all species of castings, at present having quite a run on portions of iron fronts for buildings—columns, fire-plates, etc. Being under the management of a practical machinist—Leo. S. Whitehead—it will continue to expand until it will require enlarged quarters. A. D. Holdaway is president.

This latter gentleman is also president of an iron company lately organized in Provo for the avowed purpose of developing iron mines which exist on the west side of Utah lake. By taking this matter in hand, the mines may be made tributary to Provo, and the interests of the city thereby enhanced. We admire a wide-awake spirit on the part of citizens of a town, and hope the gentlemen associated in this organization may be successful according to their enterprise.

There are coal mines in Pleasant valley, some 60 miles southeast of Provo, which are being rapidly developed by the D. & R. G. R. R. Co. and other parties. Much of the coal is of fair quality, and will be of great value in connection with the smelting operations which are now in progress in Utah, or may be inaugurated. Coal is also found in San Pete valley and in Castle valley, each on the east side of the Wasatch mountains, in Utah. It is estimatsd that there are coal lands in the Territory to the extent of thousands of square miles.

From Provo we continue our journey southward to

Frieco,

In Beaver county. This town is the settlement which has grown up in the San Francisco Mining District, in the midst of the range of mountains of that name. The great property of the district, as well as of the Pacific Coast, is the Horn Silver mine, which is in the hill to the south of town, about half a mile away. Formerly the smelting of ores hy this company was done at Frisco, and the smelting plant still stands at the upper end of a main street of the town. But alas! for Frisco, it was found more economical to ship the ores to Francklyn, to the smelter previously described, than to transport the fuel, fluxing material, etc., to this place; so work of that nature was abandoned, and the town suffered a loss in population of three or four hundred, and the smelters here are idle. But work at the mine is quite extensive. At least 150 men are regularly employed. We have before given the product of the mine—viz., 150 tons per day—which fills 10 to 12 cars, upon which it is loaded at the mine for its haul of over 200 miles. The shaft in the Horn Silver is down 800 feet. New hoisting works, with fine machinery from the Union Iron Works, S. F., have just been completed. The mine requires no pumps, as there is no water to he handled. The ore comes out dry and semi-pulverized. It is of a yellowish cast, and, as before stated, carries 30 per cent of lead. It is considered an unhealthy mine to work in, hy reason of the dry lead-powder which is inhaled or absorbed by the workmen. Many miners have left the locality "leaded" so badly that they were partially paralyzed, and many more are troubled with the "wrist-drop," which is a species of paralysis of the wrist joint. For these reasons the workmen at the Horn Silver are more than ordinarily temporary, and the force of underground miners is constantly fluctuating. But the managers do not seem to he embarrassed for help. There are idle men in this camp, as well as in most others which we have visited during the past two months.

The Frisco Mining and Smelting Company in the next most extensive concern operating is this district. Its main property is the Carbonate mine, about two miles north of Frisco. When under full headway at this mine, 25 to 30 tons of ore per day are taken out. It is a high-grade galena ore. The works at the mine are of a peculiar character, being upon no connected system, but are an accumulation of suitable machines from different factories for the concentration of ores dry. C. D. Bigelow, now deceased, formerly of New York, and president of the company, superintended the construction of these works, and as he was an engineer whose specialty was labor-saving machinery, he succeeded in accumulating a plant which does its work well. Dry concentration was necessary because there is no water supply in the locality. Enough water is now pumped from the mine to run one Frue Vanner, which is kept steadily at work upon the finer grades of ore. After concentration hy means of the machinery at the carbonate, the ore of the mine runs 50 per cent lead and 100 ozs. silver to the ton. The mill was built in 1881, and has been kept at work since. A. M. Bigelow, Esq., superintendent, and agent for Eastern owners, has his office at Milford, in Beaver county, while L. D. Davis has charge of the mill at Frisco.

The great want or lack in the San Francisco district is timber and water. There are unquestionably fine properties in the mountains near Frisco, if the ores which might be produced could be concentrated by means of water in the ordinary way. Here is a field for the inventors of dry concentrators. Make a moderately cheap machine, which will do its work thoroughly and well, and here should he found a market for many. The rain and snowfall of this region is slight, and the mountains are so low that they do not hold for a great length of time the snows which do descend during the winter; consequently, there are few streams or springs, and we see mines like the Horn Silver, 800 feet deep, with no water of any account. Water for drinking purposes in Frisco is brought many miles, and costs from 2½ to 3 cents per gallon. Under the disadvantages which we speak of, it is no wonder that there is little being done in the way of development in the district at present. But one may hear of many good prospects which possibly could offer fine inducements to those desiring to open out mining properties.

The Tintic District.

The next region visited hy the PRESS correspondent was the Tintic district, in the Oquirrh mountains, southwest of Utah lake. The district is reached via the Salt Lake and Western Railroad, which branches off from the Utah Central at Lehi Junction, 20 miles north of Provo. The Salt Lak e& Western is a Union Pacific road, and this design undoubtedly is to extend it southwesterly into Nevada, supplanting the older Utah & Nevada Railroad, which aimed for the same State hy a more northern route, and which now terminates near Stockton, 40 miles from Salt Lake City. The road out from Lehi is some 60 miles in length, and terminates in the northern edge of Juab county, at Silver City, running at an upgrade nearly all the way.

In the SCIENTIFIC PRESS of October 18th, there appeared an excellent description of the leading properties in Tintic district, from the pen of Bro. Goodwin, traveling correspondent of the Salt Lake *Tribune*, which the PRESS editor wisely copied. It might seem a "workof supererogation"—as some legal luminary might say—for us to notice these same properties again so soon. But we shall aim only to give slightly additional information to that given in the *Tribune*, and thus make the representation of this district, in successive issues of the PRESS, more full and complete than we alone could possibly have made it. We will thus gratify, we hope, a locality filled with wide-awake and enterprising, as well as kind and courteous people, with whom it was a pleasure to spend the two days of our visit.

The Tintic district is of considerable extent, comprising an area of something over 100 square miles of the mineralized portion of the Oquirrh mountains. It probably takes precedence of all other mining districts in Central Utah. It is distant from Salt Lake in a direct line about 80 miles. The ore vein system courses with the mountains in a southerly direction, and contains ores of iron, copper, lead, bismuth, with gold and silver in combination. In many instances the surface workings have been very rich in the latter minerals. The Beck & Bullion, and some partially developed mines, have produced ore running as high as $20,000 per ton; hut these are, of course, pockets or streaks in the ore bodies. But this does not indicate a character of ore too variable to work successfully. All developments that have yet been made prove the existence of ores which, hy proper handling, can be made to yield a handsome profit to workers. As is probably known, the

Eureka Hill,

At the town of Eureka, is at present the finest property in the district, and the most extensively worked and opened out. The ore is hauled by team to Ironton, where it is loaded on the cars for Salt Lake or other points of purchase. It is, of course, a smelting ore, carrying 20 per cent of lead, with 30 to 40 ozs. silver to the ton. At present the company have only 100 men at work, hut more will be put on as soon as certain arrangements are consummated. Frequently over 200 men are employed. Paul A. Shutler, of Salt Lake, is secretary and treasurer of the company; John McChrystal, of Eureka, is superintendent of the works. The latter gentleman, in company with P. Cusick, has a couple of mercantile institutions in Eureka, which do a large business. Mr. Cusick is manager of this branch of affairs. We were shown, at the residence of this gentleman, one of the most valuable private cabinets that there is in Utah, we presume. Mrs. Cusick seems to he as familiar with its mysteries as is her husband, and she has been a great aid in collecting and keeping in shape the specimens which the two have accumulated. There are in this cabinet not only representative ores of the entire district—some fabulously rich—but there are many rarities from distant parts of the Territory and country. We were well entertained for an hour or so in looking over these specimens.

Bullion and Beck.

This property adjoins the Eureka on the north, and is upon the same ledge. The mine is mainly the property of John Beck, one of the public-spirited men of Eureka, who discovered the mine, and who has opened it without the aid of outside capital. The ore is similar to to that of the Eureka, and is handled the same. Fifty-five to sixty men are employed. The foreman of the mine, Dennis Sullivan, is a practical, hard working miner, and no superintendent could wish for a more valuable assistant. We visited the mine three times and on each occasion he was below, superintending underground workings. What our mine owners need are more such foremen, who have a thoroughly practical eye to every branch of the work below the surface. The output of this mine is 35 to 40 tons per day.

The Red Bird Mine,

At Eureka, just east of the Beck, owned by S. W. Smith and Lewis Martin, is soon to he operated with energy. Some 25 to 30 men will he put to work. The prospecting and developing has been continued very quietly, with a small force, but there is now encouragement to greater expenditures of money. The shaft is sunk to a depth of 450 feet, and a fine ledge of ore has been cut and laid bare.

The Copperopolis and the Diamond.

The former of these mines, located two miles southeast of Eureka, is being worked hy a few miners on a lease, who are taking out ore for shipment, and who are doing well with the property. The Diamond is also being worked under similar circumstances. Here 15 to 20 men are employed. The only mill property at present in operation in the district, is that of the

Tintic M. and M. Co.,

At Homansville, which is located two and a half miles northeasterly from Eureka. The mill as well as the mining property of the company, is under the superintendence of Alex. Graham, Esq. The former consists of a ten-stamp battery, Steddfeldt chloridizing furnace, dry kilns, etc. The ores are worked by the dry crushing process, in which they are chloridized before amalgamation, are then retorted and the bullion secured. For a comparatively inextensive plant, it is a valuable property, and is doing a good work in the Tintic district, in stimulating and aiding development. But most of the ores found in the district are smelting ores, which must be handled as such. The Tintic Co. are working the Northern Spy mine, where they secure some milling ore for their plant at Homansville, and other ores which the mill cannot work. In the vicinity of Eureka are

Numberless Prospects,

And many prospects partially developed, where practical miners are doing something on a small scale, and in nearly every instance making more than day wages. This certainly indicates that the application of capital could he made with good effect in the Tintic district. From the history of affairs in this locality, it is found that developments on active properties, as they now stand, have been made without the aid of foreign capital. One mammoth concern, both in name and extent, the Crismon Mammoth, between Eureka and Silver City, was taken in charge hy foreign officials, representing English capitalists, but there seems to have been mismanagement at every move, and criminal extravagance, so that the result was a stoppage of operations after the mine was well opened out, and an extensive smelting plant had been erected at a point some 10 miles away, where there was little water, little fuel and other corresponding disadvantages. There is no doubt in the minds of well-informed people but that this same Mammoth mine will soon be put upon a sound basis, when it will prove an extremely valuable property to those fortunate enough to secure it.

Before we briefly allude to the mines near Silver City, we wish to speak of an enterprise of the district, with a focus at Eureka, which is laudable and practicable. This is the

Tintic School District.

The community needs a school, but because of the character of titles to town property at Eureka and elsewhere—being merely squatters' claims, and therefore valueless for taxation—there has been difficulty in founding a school fund. So a few of the leading citizens have joined, and by private donations, and through the management of a Board of Directors, have started a school at Eureka and will soon build, according to plans devised hy James Cameron, Esq., of Eureka. The present directors are P. Cusick, John Beck and G. C. Elmer; but C. H. Blanchard and L. E. Riter of Silver City, and J. C. Cameron, J. W. Green, and Arthur Brown are, or have been, intimately connected with the movement. All honor to the parties who are striving for a free school in a frontier district. The

Iron Mine of Tintic,

A mile and a half from Silver City, is one of the notable properties of Utah. It ships 120 tons per day; but the mine is so thoroughly opened that twice or thrice that quantity could be easily taken out. The vein of ore is from 20 to 60 feet thick, and it has been cut into from the surface of the hill at three different levels, so that there is no underground work, and teams back up to the very breast of the vein, and load at the foot of a solid wall of ore. The ore is valuable for fluxing material at the smelters of Utah. It carries 50 per cent of available iron—that is, that percentage of iron above the silica and other non-fluxible ingredients. Twenty-five teams are kept steadily at work in hauling the ore down the hill to the cars, for which the teamsters receive 75 cents per ton. The cost of mining the ore is about $1.25 per ton, making it cost the company on the cars at Silver City, $2 per ton. The able superintendent of the company, L. E. Riter, tells us there are now 80,000 cubic feet of ore exposed in the mine, and the vein has been traced far back into the hill. What a valuable property is here! Wm. Gundry is the foreman of the mine—a hard-working, practical man.

Other Mines in Tintic.

The Carissa, 4½ miles from Silver City, is being worked on a lease, under the management of L. E. Riter, Esq. It is yielding excellent returns, mainly in a copper ore which is shipped to Denver. About 16 men are employed.

The Tesora, near the same town, is also being developed. Two shafts are being sunk. Good ore was once before taken from this mine, but the property fell into indifferent hands and lay dormant until the present activity began.

The Park mine, almost within the limits of Silver City, is being opened by four or five men on a lease, who are taking out a low grade of galena ore, but who make it profitable for shipment by concentration and screening.

We cannot mention in detail other affairs and properties in Tintic. "The Rose of Tintic Mining Co.," a scheme of J. C. Cameron, Esq., of Eureka, at whose hands we received many courtesies, and from whom we obtained much information, is a corporation in a formative state, with large, but apparently feasible aims. It seems that A. Zeehandelaar is representing, without pay or certainty of reward, the interests of the company in Englaud, and is making some progress. We shall await further developments, and in time we may favor our readers, from data which we have at hand, with a concise description of the plans of the company. Mr. Cameron, an eccentric, perhaps, but thoroughly educated man, does not hesitate to acknowledge that he is considered visionary at home; but we venture, on our own authority, to remark that distant regions have often found "a prophet" where his own neighbors did not dream of his existence.

For the benefit of readers who did not see the article about Tintic previously alluded to, we will repeat, in closing this portion of our article, some figures which were there published. In 1883 the iron ore shipments from the district amounted to 18,000 tons, while the shipments of lead-silver are aggregated in value $900,000. This, for a district which has had two or three unfortunate set backs, and as a result of pure home industry, is, we think, a good showing.

Our Moon and the Asserted Satellites of Mars.

EDITORS MINING AND SCIENTIFIC PRESS:—Is the moon inhabited? Not if a dead world. But an object sixty yards square should he discernible on its face, if a heavenly body five miles in diameter is discernible at a distance of 35,000,000 miles from the earth.

The recent edition of Professor Newcomb's popular Astronomy, gives quite an interesting account of the discovery of the satellites of the planet Mars hy Professor Asaph Hall, August 11, 1877, with the 26-inch aperture great Equatorial Refractor; still it is only a very short abridgment of what has been published from time to time in the *Popular Science Monthly*, *Belgravia*, *The Cornhill Magazine*, *Scribner's* and others, by Professors Proctor, Kirkwood and Le Conte of our California University, which were to some extent compiled from the original Washington reports, as well as their own reflections. But all of them have failed to state what sized telescopes or magnifying powers might be hopefully used to re-discover the satellites of Mars, or have been successful already?

Prof. Newcomb merely makes a single remark about other observers as follows:—"The reality of both objects was abundantly confirmed by observations on the following night, not only at Washington, but at the Cambridge Observatory by Professor Pickering and his assistants, and at Cambridgeport by Messrs. Alvan Clark and Son." In Professor Newcomb's list of telescopes, the Cambridge Observatory is quoted at 15 inches. That includes, therefore, a much greater number of telescopes than the class of the Washington Great Equatorial would embrace.

But we are interested in knowing further

whether the present Lick Observatory, 12 inch, the English Cambridge, 12 inch, the Vienna, Oxford, Greenwich Observatory, Michigan and Paris, and many others may also be included. Have they all so reported? And do any of the observers infer that even less size and power might be used successfully? The question is an important one, not only as regards the pleasure of viewing the satellites, or at least one of the satellites of Mars—the inner and larger one—but objects of such relative magnitude on our own moon, only proportionally smaller in accordance with the proximity of our moon to us.

Say the moon is 240,000 miles from the earth—how does that compare with the distance of Mars and its satellites from the earth? Well, the distance was very favorable at the time of Prof. Asaph Hall's and the Washington observations, as the planet Mars was near its opposition and near its perihelion, or least distance from the sun, and the earth was therefore only about 35 millions of miles from the planet, while in February or March, as Prof. Newcomb explains, it would be 62 millions of miles. But the two satellites are, as Prof. Newcomb states, "by far the smallest heavenly bodies known."

The outer one being possibly only five miles in diameter and the inner one 10 miles, as therefore such objects have been seen at the distance of Mars, how much less size might be discerned upon our moon? The question is of course easily answered, irrespective of the greater amount of reflected light from an object at the distance of our moon from the sun, compared with Mars, and the relative magnitude of Mars and our moon.

Without regarding that at present, as it is partly neutralised, perhaps, by our moon being smaller than Mars, it may be sufficiently approximate to divide the 35,000,000 by 240,000, which we find is only about 1-146 the distance. Now assuming one of the planets at 10 miles diameter: that would be 17,600 yards as we all know, and one 1-146 of which would be about 120 yards; so that an object of that diameter, or perhaps only half that, 60 yards, may be visible upon our moon, if one of the satellites of Mars is only five miles in diameter; and as the moon is favorable for observation at least half the year, or about every other fortnight, we have abundant opportunity of testing whether there are any objects or buildings on the moon, say from 60 to 120 yards in diameter. Or, in case of any considerable conflagrations, as occur in our forests, the same question may be tested in observing the moon with telescopes equal to the task or pleasure. Will a 10 inch aperture refractor suffice; or what size be requisite? Of course if the moon, or our moon, is a dead planet, there is no hope of finding a building upon it say a hundred yards in hight and width, and an observation of the moon, therefore, with similar powers used for the observation of the satellites of Mars at its perihelion, could still only give us a negative answer; but it would be a negative fact, demonstrated, which, until so small an object as a satellite of Mars was discovered at that distance we had no positive means of ascertaining, or at least no precedent, as we appear to have now.

There are some three or four 8 to 10-inch aperture telescopes, I believe, in Oakland alone, and it would of course be interesting to know if they have afforded a peep at the satellites of Mars, or found a building on the moon about as large as the Capitol at Washington or St. Peter's at Rome, or St. Paul's, London, or one of the Russian mosques; and although it is only for a week or two every 15 or 17 years that Mars and its satellites are so favorably situated as they were in 1877, 1862, 1845 and 1830, our neighbor, the moon, is nearly always within reach of successful observations. It would be well if astronomical books tabulated the distance of Mars from the earth for every month in the year for the rest of this century, as the distance is so variable even at its oppositions.

A. F. GODDARD.

Sacramento, Oct. 8, 1884.

THE ORIGIN OF COAL.—Mr. G. W. Froggatt writes a letter to the *Australasian*, in which he directs attention to a statement made by Dr. Taylor, to the effect that an interesting side-light has been thrown on the origin of coal by a paper read before the Geological Society by Mr. Wethered, who showed that some coals were practically made of the spores of cryptogamic plants. Dr. Taylor further stated that nobody has before thought that some of our coal beds are actually due to similar vegetation which grew in the swamps and marshes of the carboniferous period. But Mr. Froggatt writes, in reference to this, that he was quite under the impression that it was an established fact that the origin of a very large number of the best known and most valuable coal beds in Great Britain and other parts of the world was due to the sporangia and spores of cryptogamic plants nearly allied to the club moss and other similar plants. The object of Mr. Froggatt's letter is apparently to show that Mr. Wethered is by no means the originator of the "saccular" theory of coal formation.

TRAVELERS visiting Salt Lake city will find many excellent hotels, where accommodation of good character can be had at very reasonable rates. The city is highly favored in this respect. The PRESS correspondent was well cared for at the Valley House—A. C. Brixen, proprietor. The location is central, the rates reasonable, and attention to guests is more than ordinarily close and respectful.

USEFUL INFORMATION.

Tobacco Waste as Paper Stock.

A correspondent of the *Paper Journal* writes: I mail you herewith two samples of paper made from tobacco stems and waste. I have made three runs, and have used as high as 70 per cent of tobacco stock. Experts say it is equal to linen rags, which cost from $70 to $80 per ton. Tobacco stock costs less than $10 per ton, and there is no expense for assorting, while the shrinkage is nominal, against 33 per cent in rags. Tobacco stalks will make paper equal to manilla. According to the United States census, the yearly tobacco waste is festimated to be from three to four hundred million pounds, with a tendency toward a larger supply at lower prices, as against a tendency in all other paper stocks to cost more because of decreased supply. B.

SOLDER FOR ALUMINUM.—Col. Wm. Frishmuth, of Philadelphia, Pa., says: The following receipts to solder aluminum have been tried by me and found practical. Take 10 parts silver, 10 parts copper, 20 parts aluminum, 60 parts tin, 30 parts zinc. The above solder is excellent for chains, etc., and can be used for the blowpipe operations. For a solder with the common solder iron, take either 95 parts of tin, 5 parts of bismuth; or 97 parts of tin and 3 parts of bismuth; 98 parts of tin and 2 parts of bismuth; also 99 parts of tin and 1 part of bismuth; the fuse to use in all cases is either paraffine, stearine, vaseline, balsam copaiba, benzine. Articles so soldered must be cleaned well before soldering, and the parts to be soldered must be heated to just enough to make solder adhere to the parts to be soldered. These alloys of solders, as above stated, can be changed to suit the operator.

THE BRAN PACKER PRIZE.—It is said that a very large number of plans, specifications and models of machines for packing bran have been received, many of which show great merit. It will probably be a knotty question for the committee to decide which is really the best machine and to whom to award that $1,000 prize. A prominent miller says that he thinks this country would be better off if no machine was invented which would make it possible to export bran in large quantities to foreign countries—that every pound of bran should be kept here for the purpose of feeding to our live stock. There is considerable in this argument, but nevertheless, if a good and economical machine is invented it will meet with a large sale. We hope the machine will be invented and the inventor rewarded at the December meeting of the Millers' National Association.

SAFETY OF RAILROAD TRAVELING.—According to published statements, not a single individual riding on a passenger train in Massachusetts was killed the past year, unless the cause was directly traceable to the carelessness of the person killed. Over 61,000,000 passengers were carried, at an average distance of 15 miles each. According to this statement, it is safer to be on a passenger train in Massachusetts than to be almost anywhere else. It is a remarkable fact that fewer accidents causing death occur on suburban trains, or those running through thickly settled districts, than in the open and sparsely settled country. The *Northwestern Lumberman* concludes that the reason for this is that more care is taken with such trains: that the shocking railroad accidents that are continually happening are the result of gross and criminal carelessness on the part of both managers and employees.

SUBSTITUTE FOR GOLD BRONZE.—According to the experiments of Dr. B. W. Gerland, metavanadic acid may be used in the preparation of a substitute for genuine gold bronze. If a solution of sulphate of copper sal ammoniac is mixed with vanadiate of ammonia and cautiously heated, then is obtained a compound of a splendid gold color, which is deposited from the liquid in the form of gold-colored spangles. These admit of being readily ground up with gum and varnishes, cover well, do not change on exposure to air, and are in every respect equal to genuine gold bronze. Vanadium yields also a series of very fine colors, especially adapted for painting on porcelain.

TO REMOVE SPOTS FROM WOOLEN CLOTH.—An excellent tincture to remove spots from woolen cloth is made of alcohol 90 per cent, sulphate of naphthaline, French oil of turpentine, spirit of sal-ammoniae and soap-wort. The latter must be boiled, sieved, mixed with the other four ingredients and bottled. To remove spots of tar, rosin or wax, soap-wort can be dispensed with, the other chemicals being sufficiently effective.

CORKS FOR CHEMISTS' BOTTLES,—Which are to close air tight, are prepared by laying the corks for 12 hours in a solution of 15 g. gelatine or good glue and 24 g. glycerine in 500 g. water, the solution to be heated to 44 or 48° C. After drying, these corks can be used to good advantage. When they are to resist acids, immerse them for a time in a mixture, heated to 40°, of 2 parts vaseline and 7 parts paraffin.

STRAIN ON BAND-SAW BLADES.—A well-known band-saw manufacturer of Rochester, N. Y., Mr. F. H. Clement, writes as follows to the *American Journal of Railway Appliances*: "I have made some experiments on strain of band-saw blades, and while I do not consider they are exhaustive, I think they pretty nearly represent the average practice. Of course there is a wide difference in the ideas of operators about the necessary amount of tension on the blade, and my figures are based on my own judgment. The strain was weighed on an ordinary platform scale, by means of a lever and suitable fulcrums. For a 3 16 inch blade, No, 21 gauge, running 3,500 to 4,000 feet per minute in ordinary sawing, the strain was 151 pounds. For ½-inch blade, No. 21 gauge, same conditions, 214 pounds. For 1-inch blade, No. 20 gauge, same conditions, 358 pounds. These figures are the actual tension on the blade, the weight of the wheel and its bearing and the friction on the ways being first deducted. On a heavier machine of my make for splitting or resawing, a 2½-blade, No. 20 gauge, running 5,500 feet per minute, cutting 19 inches wide, has usually from 1,100 pound to 1,300 pound tension, including the weight of the wheel and its bearing and the friction on the ways.

THE SWIFTEST RIVER.—A German scientist has drawn attention to the fact that the Sutlej, one of the great streams of British India, is probably the swiftest large river in the world, having a descent of 12,000 feet in 180 miles, an average of about 67 feet per mile.

EFFECTS OF TEMPERATURE ON ROOTS.—M. C. Barthelemy, having placed a number of hyacinths in glasses in a circle around the pipe of a stove, found that the roots took an almost horizontal direction toward the pipe, as a common center of attraction.

BELTS running vertically should be drawn tighter than when running horizontally, else they will not adhere to the lower pulley closely.

THE oldest apothecary shop in Berlin, which in 1888 might celebrate the 400th anniversary of its existence, has just been sold for the sum of $300,000.

GOOD HEALTH.

Lunch or Dinner—Which is Best for the Mechanic at Noon-Time?

Opinions differ in regard to the subject, and perhaps a few thoughts as expressed by various mechanics may prove interesting to some readers. Advocates of a hot dinner at the regular noon hour, claim that it is much preferable, when possible, to sit at a table where the meals are served hot; that the walk from the building to the hotel or restaurant is in many cases a needful change of exercise, especially when one has been working steadily at the bench; also, the mind receives rest by the different sights encountered, enabling the workman to put aside cares and trials for a while, so that upon his return, his mind, as well as body, will be fresh to encounter any perplexities that may be met. Stress is laid upon the fact that the lunch men, especially when the day has been warm, and under-clothes soaked with perspiration, are liable to colds or chills from sitting around a whole hour in a tool house, or on the shady side of the building. Many other arguments are used, but the foregoing are the principal.

On the other hand, the lunch men claim that, in order to get a hot meal, one must be ready to instantly drop tools the minute the whistle blows, or upon the call of time by the foreman, in order that not a minute be lost, so that the "hot meal may be got at" in the shortest possible time. Rush must be the word—to the meal, eating the same, and back to the building—all to be done inside of one hour.

The lunch men also claim that hot coffee is not the only stimulant necessary for the dinner men, and that the *other hot* is one of the principal reasons for a walk to dinner. The claim in regard to brain rest is all bosh. The latter named portion of the anatomy receives much more rest by an intelligent discussion for half an hour on the quickest method to find the length and bevel of any brace, rafter, etc. After a warm morning's work, the workman is exceedingly particular to pick out a nice warm spot, free from draft, where lunch can be eaten without danger of catching cold. Twenty-five minutes is an ample space of time in which to satisfy nature's cravings, leaving full thirty minutes for rest.

Each side advances good arguments in favor of their respective views. We are promised several communications upon the subject, and will publish those that are the most suitable. We will be pleased to hear from any of our mechanical friends in regard to lunch or dinner at the noon hour.—*Exchange.*

Loss of Form.

After women pass middle age they lose a considerable amount of their hight, not by stooping, as men do, but by actual collapse, sinking down. This is mainly to be attributed to the perishing of the muscles that support the frame in consequence of habitual and constant pressure of corsets and dependence upon the artificial support by them afforded. Every girl who wears corsets that press upon these muscles and restrict the free development of the fibers that form them, relieving them of their natural duties of supporting the spine, indeed incapacitating them from so doing, may feel sure she is preparing herself to be a dumpy woman. A great pity! Failure of health among women when the vigor of youth passes away is but too patent, and but too commonly caused by this practice. Let the man who admires the pieces of pipe that do duty for a human body, picture to himself the wasted form and the seamed skin. Most women, from long custom of wearing the corsets, are really unaware how much they are hampered and restricted. A girl of twenty, intended by Nature to be one of her finest specimens, gravely assures one that her corsets are not tight, being exactly the same as those she was first put into, not perceiving her condemnation in the fact that she has since grown five inches in hight and two in shoulder breadth. Her corsets are not too tight because the constant pressure has prevented the natural development of heart and lung space. The dainty waist of the poet is precisely that flexible slimness that is destroyed by corsets. The form resulting from them is not slim, but a piece of pipe, and quite as inflexible.—*Exchange.*

THE HOT WATER REMEDY.—Relative to hot water as a remedial agent, *Hall's Journal of Health* publishes some interesting hints. It says: A strip of flannel or a napkin, folded lengthwise, and dipped in hot water, and wrung out, and then applied around the neck of a child that has the croup, will usually bring relief in ten minutes. A towel, folded several times, dipped in hot water and quickly wrung, and applied over the seat of pain in toothache or neuralgia, will generally afford prompt relief. This treatment in colic works almost like magic. I have seen cases that resisted other treatment for hours, yield to this in ten minutes. There is nothing that will so quickly cut short a congestion of the lungs, sore throat or rheumatism, as hot water, when applied promptly and thoroughly. Pieces of cotton, dipped in hot water and kept applied to old sores or new cuts, bruises and sprains, is the treatment now generally adopted in hospitals. I have seen a sprained ankle cured in an hour by showering it with hot water from a hight of three feet. Tepid water acts promptly as an emetic, and hot water, taken freely half an hour before bed-time, is the best of cathartics in the case of constipation, while it has a most soothing effect on the stomach and bowels. This treatment, continued for a few months, with proper attention to diet, will cure any case of dyspepsia. Headache almost always yields to the simultaneous application of hot water to the feet and back of the neck.

NO NEED TO DROWN.—"I always dread the return of the season when sea-bathing is indulged in," said a gentleman. "My family have had several narrow escapes, and still they have a perfect mania for the water."

"Why, there is no need to be afraid," answered his friend, "if you but retain your presence of mind. When you find yourself in deep water you will sink at first, but if you do not struggle, you will come quickly to the surface again. On reaching it immediately draw a full breath and throw your head back. This will have the effect of placing you in a recumbent position on the surface of the water. Now, this is the most critical moment for those who do not know what to do next. Extend your arms at once on a level with your shoulders, with the palms of your hands downward, and begin gently paddling in the water, with the movement of the wrist only. Extend your legs quietly and slowly in a line with your body. If you raise your arms, your head or your legs above the surface of the water, you will sink; but if you have the presence of mind not to do so and not to struggle about, you will never sink, so long as you keep paddling gently without exertion. So you may float on until you are picked up, or until you are numbed by the cold."—*New York Sun.*

CLAY PIPES FOR SMOKERS.—The *Popular Science Monthly* advocates the use of clay pipes. It says: "The white earthen pipe, porous and permeable to liquids is put first; because it is a good absorber of nicotine; the metallic pipe is put last, because it allows all the products formed during the combustion of the tobacco to reach the mouth of the smoker. The meerschaum, which immediately follows the clay pipe, deserves its place only on condition that it is not too old. If it is seasoned it is as bad as a wooden or porcelain pipe. The seasoning of which poets have sung may be full of charms for the amateur; to the hygeuist it simply indicates that the pipe has had its day, and is now saturated with tobacco juice, and it must be replaced by another one, or be passed through the fire to purify it, as is done in the coffee houses in Holland. Every old pipe, browned with long use, leaves on the lips and tongue an acrid and strong smelling liquid which irritates the tissues and corrodes the mucous secretions. When it has reached this condition the finest meerschaum is no better than the meanest scorch throat.

BLOOD SWEATING.—A physician of New London, Conn., has a patient who experiences blood sweating. The disease is not fatal nor serious. The patient sweats bright, healthy blood from the arm-pits. The sweating is supposed to be caused by an enlargement of the pores of the skin. There are only ten similar cases on record.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

MIDDLE BAR TUNNEL.—*Ledger*, Oct. 30: The entire breast of this tunnel penetrated ledge matter early this week. The quartz is said to look well, but whether it will pay to work can only be determined by actual test. The rock is supposed to be of the same character as that met with in the upper tunnel, which has proved so wonderfully rich in free gold.

GILLICK CLAIM.—Mr. Gillick has got out about 200 tons of ore from his claim 2½ miles below Volcano. He expects to commence crushing in a few days. The last run paid over $50 per ton. The ore now on the dump is expected to average from $30 to $40 per ton.

Inyo.

GOOD ENOUGH.—Inyo *Independent*, Oct. 31: When down at Darwin a few days ago, Sheriff Gregg visited a claim on which a strike has lately been made by Jerry Fitzgerald, and his partner, Richard Decker. Enough work has been done to prove the ledge well defined and of good extent. The ore is silver and carries 1600 ounces per ton. The same parties are now opening another ledge in the same locality that goes 800 ounces per ton. Mr. Gregg brought some of the ore to town; in the best specimens native silver runs all through the ore. These samples look very rich. Near Darwin, Fitzgerald and Decker some time since found a vein of copper that carries 40 per cent of this metal and some silver. They are certain this ore will pay a good profit by shipping to San Francisco, and intend to begin making shipments soon. J. E. Eddy has teams at work hauling wood to Snow's canyon; he has a large quantity of valuable ore at the mill there, and expects to begin crushing about ten days hence. This ore is certain to leave a big margin of profit.

A GOOD MINE.—Inyo *Independent*, Oct. 31: The perseverance of Mr. John Alexander in developing the White Hill mine is now nearing a rich reward. The mine is so far opened that the ledge is exposed for a long distance and runs from 15 inches to 2½ ft wide. A small shipment of the ores was recently made to Selby & Co., San Francisco, and yesterday Mr. Alexander received a communication from Mr. Ralston, president of the Smelting Company, who writes: "The ore from the White Hill mine contains 83 ounces per ton of silver, worth $107.31 and 69 per cent of lead. This is splendid ore for smelting, and we will be pleased to get it." Mr. Alexander now has men at work making a good road to the mine, and will soon begin shipping ore.

FROM KEELER.—A Keeler correspondent says: "Since the shutting down of the Owens Lake Company's mill, which was done last week, the pleasant sound of the stamps and the early morning call of the steam whistle are missed. Nevertheless, the town is lively still, and the new hotel is going bravely on to completion. When this building shall be finished it will excel any other hotel in the county in appearance, and under the management of Mr. and Mrs. Barnes will not be less excellent in attractions at table, comfort in rooms and general attention to the wants of guests. In this very essential matter of public accommodation Keeler is a favored town. The late successful run at the mill has added more proof, if that were necessary, that but for a very unfortunate interference the machinery might have been kept in motion during the past year and a half with profit to the company, and benefit to the whole mining interests of the county.

Nevada.

WASHINGTON.—Cor. Nevada *Transcript*, Oct. 30: The little town of Washington is at present, and has been for some time past, the busiest and liveliest place of its size in the county. Heavily loaded wagons are coming in and going out daily with lumber and merchandise of different kinds, the lumber for present use for building purposes at the mines and the merchandise to be stored for the coming winter's use. Washington at one time away back in the fifties was considered one of the richest mining camps in the State. At that time it had its rich Jefferson's Bar, Poorman's creek, Brandy Flat, Jackass Flat, Rocky Bar, Scotchman's creek and many other places that were equally as rich, from which millions of gold were taken. But those halcyon days did not always last, and for years afterward times looked pretty blue to most of the old residents. A few of those that had means to leave did so, while many others stuck it out and hoped for better times. Better times have come at last. During the past year new life seems to have been infused into the place, caused by the discovery of rich and valuable quartz mines in this section. The mines that are of the most value are all located about six miles above Washington on or near the South Yuba river. Even to-day a good deal of money is being taken out of the river and bars near here, mostly done by Chinamen. Brandy Flat, a few hundred yards below town, is being fitted up for mining purposes and will be in running order in a few weeks. It is owned by a San Francisco company. Wm. Yeaw, of San Francisco, is their superintendent. Hank Place is now just finishing cleaning up bedrock in his claim at Omega. The Omega Hydraulic Company have done no work the past season, but are all ready to turn on the water as soon as suitable arrangements can be made with Judge Sawyer. The first quartz mine of any note reached on going up the river from this place is called the Canyon Creek ledge, now owned by Geo. G. Allan, of Nevada City. It is supposed to be a valuable property, and report says that it is now or will be bonded to a New York company. Just opposite and on the south side of the river is what is known as the old Baker ledge. It looks well and I have no doubt but what it will prove to be a valuable property when more fully developed. A few hundred yards farther up the river on the same side is what is called the Ocean Star ledge. It has a number one 10-stamp mill standing on it, but at present is idle. The ledge has been but little developed, but what is in sight looks well. It is owned by a Chicago company. A mile or so farther up Diamond creek there are a number of good-looking ledges, though but little developed as yet. The next mine reached is the Yuba, six miles above Washington. It continues to look well and it is said new and very rich developments are being made. They are working about 35 men. One mile and a quarter farther up the river is the Eagle Bird mine. It grows richer and better every foot as they go down on it. The mine has only been worked a little over one year, and in that time they went down about 180 ft and run on the ledge in all about 330 ft, and all good-paying rock. A new 20-stamp mill is now being erected on the mine. It is from the foundry of Geo. G. Allan. J. R. Collins is superintending the mill and carpenter work. It is expected to be in running order on or before the first day of December. A new bridge has been built across the river at the Yuba mine, and a good wagon road has been made from there to the Eagle Bird, where they are working from 30 to 35 men. The Lindsay mine, owned by Greathouse, Robinson and others, of San Francisco, is to have a new mill up before the snow flies. It is to be a Huntington mill or crusher. Below the Lindsay mine and just opposite the Yuba is what is called the Grissel & Foster mine. It has been but little developed as yet, but what is in sight looks very well. It has been bonded to a San Francisco company for a good round figure. Further north are the Baltic, owned by McBean, Mead and others, the Star, California, Salina and many others too numerous to mention in this communication. They all look well. A person living up this way that don't own a quartz ledge is considered poor indeed.

A VALUABLE MINE.—Nevada *Herald*, Nov. 4: Probably the most promising gold mine in the State to-day is the Eagle Bird quartz mine at Washington, in this county. The shaft is down 220 ft, and in the bottom there is a seven-foot ledge of rock that will yield $200 to the ton. This extra rich deposit was only discovered a short time ago, but the general character of the ore has been far above medium ever since the present company commenced sinking on the mine, and has been growing richer as a greater depth was attained. In the drifts the ledge averages from 3 to 7 ft in width, producing quartz that is worth from $14 to $16 per ton. Two of the Huntington patent rotary mills have been in operation for several months and a new 20-stamp mill will soon be ready. The mine is owned by 3 men, who purchased it from the original owners about a year ago, paying something like $5,000 for it. Since then the mills have been put up and developments pushed forward, the returns from the mine paying for everything, even for the mine itself. At present the property could not be bought for $200,000. No mine ever discovered in the State gave better promise of richness and permanency than does the Eagle Bird.

Sierra.

GOOD REPORTS.—Sierra *Tribune*, Oct. 31: Considerable excitement prevails at Howland Flat over the outlook in the Empire gravel mine. The Company some time ago encountered what is purported to be a back channel, the same that was formerly worked by the Bonanza Company. Where the Empire owners are working on the channel it is quite wide and pays handsomely. The Company shipped 160 ounces of gold below, last week. The owners of this claim have shown pluck and energy in prosecuting operations under adverse circumstances, and we are glad to note their success in finding pay-grit.

SLICKENS DAMS.—Several mine owners in the northern part of the county have joined issues and put the dam in Slate creek in shape to hold the debris in durance vile. They have also built a strong and substantial dam about one mile below the old one in the same stream. Charles Deasing, of Howland Flat, has had charge of the work.

A GOOD PROSPECT.—In company with George Abbe a *Tribune* reporter, paid a visit to the Decatur quartz ledge located in Lady's canyon, about six miles from here. The mine is owned by Messrs. Abbe, Flint and Sawyer. The ledge is an immense one and can be traced on the surface several thousand feet. Two inclines have been sunk on the ledge for prospecting purposes, and some very good results were obtained. About one month ago the Company put men at work running a tunnel, which will reach the vein in about 200 feet and giving nearly 300 feet of stoping ground. The tunnel has already been run about 50 feet. The claim is located on a steep mountain side, and therefore can be worked upon to a great depth with tunnels. Sufficient water can be obtained from the canyon to run several stamps the year around, while a splendid growth of timber abounds close at hand.

OPERATIONS AT THE FLORENCE MINE.—At the Florence quartz mine, situated a few miles above here on the Henness Pass ridge, the tunnel is being run ahead. J. M. Frost, of Oroville, has purchased an interest in the property, and under his directions it is proposed to thoroughly prospect the claim. The eight-stamp mill has been put in good repair and it will be started up on ore from the mine next spring.

LUCKY.—Nevada *Transcript*, Oct. 30: P. F. Simonds has just returned from Downeville, near which town he and C. W. Cross, his partner in the law business at this city, are having an eight-stamp mill erected on the York quartz mine, John H. Higgins of this city being in charge of the work. The mill will be completed in about six weeks, and is to be run by water power. A series of tunnels running into the mountain tap the ledge which has an average thickness of two and a half feet, and there is no necessity for hoisting or pumping machinery as there is enough ore above the lower tunnel to keep a mill going day and night for a lifetime. The mill is being built about 500 feet from the mouth of this tunnel, and cars running on a tramway will land the ores right at the batteries. Mr. York, until recently the owner of the property, has been working there for a long time, doing his crushing with an arastra, and the average yield of the ore has been $11 a ton.

BALD MT. EXTENSION.—*Mt. Messenger*, Nov. 1: Five wagon loads of steel rail and iron pipe arrived this week at Forest City for the Bald Mt. Extension Co., and the work of putting it in the main tunnel is vigorously progressing. When this is accomplished, blasting will be commenced on the incline to be put up in the lava flow at the eastern side. No gravel has been taken out lately through the shaft beyond there on account of the impure state of the atmosphere.

San Bernardino.

KRAMER MINES.—Cor. Calico *Print*, Nov. 4: Since my last communication to you we have completed our house and with 60 feet of pipe have conveyed water to barrels sunk in the ground. We have plenty of water. The Belden mine is down some 16 feet and is looking fine. We are now sinking on a fine looking, good prospecting, free gold ledge. Down about eight feet. Mr. W. E. Moore called on us last week. He is an old prospector and assayer. He is well pleased with our mines. Mr. H. B. Stevens, of Calico, was also here. He thinks we have as fine ore as anybody's at the same depth. We are all in good spirits. I have learned that some parties have found some good prospects about six miles from Yucca (Rogers station,) and that they feel confident that a good camp will be established there.

NEVADA.

Washoe District.

ALTA.—Progress has of late been very slow in the east drift on the 2150 level, owing to the tapping of a heavy flow of water. This has been quite unexpected, as it was thought that the greater part of the water had been drawn off through the diamond drill holes and the large seams tapped by the drift. The pump is being kept running close up to its full capacity. The water at present being pumped undoubtedly comes from the vein, and being pumped now it will not be necessary to pump it when the vein is cut. Superintendent Boyle is determined that the mine sball not again be flooded. He does not advance a drift a foot while there is water to be handled by the pumps. It is a slow process, but when he gets into the mine he will have no more trouble than at present.

OPHIR.—Good progress is being made in the drift on the 500 level, and it will soon tap the old works. Some low-grade ore is still being taken out from the 250 level. The south drift on the 1500 is making about 60 ft a week in rock of a favorable character. The station at the 3300 level has been completed, and a diamond drill hole has been run to the west about 300 ft, all the way in dry ground. The material is a mixture of quartz and porphyry.

COMBINATION SHAFT.—The working station at the 3000 level is completed and the next thing in order is the cutting out of a pump station. The new hydraulic pumping machinery constructed at the Risdon Iron Works in San Francisco for this shaft has been completed and will be set up and a public exhibition of its working power will be given to-day, after which it will be taken apart and shipped to this city to be put in place on the 3000 level.

HALE AND NORCROSS.—The station at the 2900 level is completed, and a crosscut can now be started at that point whenever the powers that be so decree. All the repair work at the 2400 level is completed. No crosscuts have yet been commenced on the 2800. It is not likely that any decided development work will be done until after the election.

SIERRA NEVADA.—The north drift on the 3000 level is cutting some very good ground. In this part of the mine are some streaks of quartz that promise well. There is a fair showing for a considerable amount of paying ore on that level, and the drift will be driven to the northward a sufficient distance to prove the value of the level.

BEST AND BELCHER.—West crosscut No. 1, on the 825 level, which was commenced on Monday, is progressing in very favorable material. There is to the westward a large area of unexplored ground that promises well, and the chances are that a great deal of low-grade ore that will pay a fair milling profit will be developed.

BENTON.—The 2150 drift is being advanced as rapidly as possible. There is an unexpected amount of water coming in, but the pumps are handling it. The Superintendent will advance so cautiously that there will be no trouble from water.

GOULD AND CURRY.—The principal point of interest in this mine is the 825 level crosscut. What this crosscut will develop remains to be seen, but the indications thus far are very favorable.

EXCHEQUER.—Are working on both the 600 and 900 levels. A very heavy deposit of quartz has been found, which is liable to carry ore at some point, as assays of from $5 to $10 a ton are obtained in all parts of it.

SAVAGE.—The tunnel that is being driven in from the level of E street is now about where it will cut the vein. It will probably find a considerable deposit of low-grade ore that will pay well for working.

OVERMAN.—The usual amount of low-grade ore is being extracted on the 226 or Petaluma street tunnel. The ore taken out is being worked at the Vivian mill.

CON. VIRGINIA AND CALIFORNIA.—On the 1750 level rapid progress is making in the northwest drift. Extensive explorations will presently be made at this point.

UTAH.—The southeast drift on the 1050 level is in a very favorable formation of vein porphyry, showing seams of clay and streaks of porphyry.

YELLOW JACKET.—About the usual amount of ore is being extracted from the old upper levels. The prospect drifts are showing up well.

ANDES.—A considerable amount of low-grade ore is being taken out on the north drift. The west drift is showing good material.

SCORPION.—The main north drift continues in vein porphyry, which shows occasional seams of clay and stringers of quartz.

BELCHER.—Sufficient ore is being extracted on the old upper levels to keep the mills on the Carson river in operation.

CROWN POINT.—About the usual amount of low-grade ore is being extracted and sent to the mills.

Belmont District.

BELMONT *Courier*, Oct. 30: The new winze is down 20 ft, with about 18 inches ore. Face of 200 foot level in very hard rock; progress slow. Mill running well, with plenty of ore on the dump. Leaching tanks running better than ever. Shipped last Monday two bars, valued $5,228.

Bernice District.

MILLING.—Cor. Reeve River *Reveille*, Oct. 30: Goodall has 30 men in his mine and 10 in and around the mill. The mill will run all winter, as they have 150 tons ahead now, and the mines can take out ore fast enough to keep ahead. The result of an 18-day run of the mill was a shipment of six bars of bullion valued at $7,125. The outlook of the camp is very promising.

MILL.—Reese River *Reveille*, Oct. 30: Goodall has 30 men in his mine and ten in and around the mill. The mill will run all winter, as they have 150 tons ahead now, and the mines can take out ore fast enough to keep ahead. The result of an 18-day run of the mill was a shipment of six bars of bullion, valued at $7,125. The outlook of the camp is very promising.

Red Canyon District.

A STRIKE.—Virginia *Enterprise*, Oct. 30: James and Thomas Boyd and Frank Meagher, who have been working in their mine—the Sunflower—near Bullionville, Red Canyon, report that they have made a rich strike. They have run a tunnel eighty feet, and are working on a three-foot ledge containing rich gold and silver-bearing quartz. The ore is very uniform, and they have heretofore made several flattering assays, but since the recent development are sanguine of a bonanza.

Rebel Creek District.

THE OHIO MINE SOLD.—*Silver State*, Nov. 1: The Ohio mine, in Rebel Creek district, has been sold to a Salt Lake company, which is represented here by Joseph J. O'Tool, superintendent of the Brooklyn Lead Mining Company of Utah. The sale was closed, and the money paid yesterday to F. P. Snapp, Joseph McColley and John Snapp, the owners of the property. The mine, which has been worked on a small scale, has produced very rich ore, which was generally shipped to Salt Lake for reduction, and yielded from $300 to $800 per ton. Practical miners and experts who have examined the mine, pronounce it valuable property; but as the owners were engaged in other business, they never worked it extensively. The price paid for the property was, we are informed, $50,000. It is the intention of the purchasers to develop it systematically and build reduction works on the ground.

Sherman District.

THE BURKE MINE.—Virginia *Enterprise*, Nov. 4: Next week will be commenced the removal of the machinery of the old Wells, Fargo mine to the Burke mine, Sherman district, some miles to the north of this city. This machinery is just what they need at the Burke.

Tuscarora District.

NORTH BELLE ISLE.—*Times-Review*, Oct. 30: The workings on the 70-ft level have been forwarded the past week with good results. The usual progress has been made in extending the drift north.

BELLE ISLE.—The usual progress has been made with the work at all points; no material changes to note.

NAVAJO.—South drift from No. 3 crosscut, 150-ft level, has been extended 22 ft. Have started an upraise on the vein near the face of this drift. North drift from No. 3 crosscut has connected with south drift from No. 2 crosscut; total distance between crosscuts, 116 ft. No. 1 upraise, north of No. 1 crosscut, has been carried up a total distance of 37 ft. The vein at all points on this level has yielded a good grade of ore. The usual progress has been made in extending the drift south on the 250-ft level. The workings on this level are looking well, and producing the usual quantity of ore.

White Pine District.

IMPROVING.—Eureka *Sentinel*, Nov. 4: The mines of White Pine are reported to be improving and the ore output increasing. The outlook, in fact is flattering and next year will doubtless make the best showing that has been experienced for several of the past season.

ARIZONA.

THE HOODOO STICK.—Tombstone *Epitaph*, Oct. 30: A good deal of excitement has been created by a recent strike made on the claim adjoining the Great Eastern, in the vicinity of Ajax hill. It was made by Mr. A. C. Smith, who has interested with him Messrs. White and Gans. It is claimed that the discovery was made by means of the divining rod, or as miners call it, the "hoodoo stick." Certain is it, that at the point at which Mr. Smith began sinking, the surface showed no indication of mineral, nor in fact a cropping of any kind. Trusting in the "hoodoo," however, work was begun, and at the depth of 3 ft, the workmen encountered a ledge of grey carbonate, from which assays have been running as high as $6,660 in silver and $42 in gold. About 30 tons of ore have been taken out, the ore dump being much larger than the waste dump. The bottom of the shaft is now all in ore, and the indications point to one of the greatest mineral discoveries ever made in the camp.

SILVER MOUNTAIN DISTRICT.—Prescott *Courier*, Oct. 30: Mr. Warren C. Potts is going to Silver Mountain mining district, where there are about 10 men doing assessment work on mines which belong to Mr. Potts and others. The district is 55 or 60 miles south of Prescott.

THE QUIJOTOA MINES.—The latest report of Superintendent Smith is as follows: All work is going ahead as usual. Peerless tunnel No. 1, is in 325 feet. At a distance of 312 feet we cut a well defined foot wall dipping to the west at an angle of 68 degrees. The material passed through up to the present time looks very favorable, showing some very good streaks and bunches of ore and of a very much softer nature than any place where the vein has been cut heretofore. The north lateral drift being driven on the vein from Crocker tunnel No. 4 is in 66 ft; assays from the face to-day, $9,100. The general appearance is much more favorable as we go north. The winze from the south drift in the main tunnel is down 12 ft, and shows quite an improvement since last report, and will, in my judgment, improve in depth. Sinking of the winze on the top of the hill is being shoved ahead as fast as possible. One upraise will be started from tunnel No. 1 at once in order to make connection, which will facilitate our work very much. A portion of the machinery for the air compressor is on the ground.

OLD DOMINION MINING CO.—Arizona *Silver Bell*, Nov. 2: The mining and smelting works belonging to this company have just finished one of the most remarkable runs ever recorded. It was expected that the production of the two 30-ton furnaces for 30 days, ending this morning, would be fully 556 tons of nearly pure copper, from 18 per cent ores—copper

which when refined, at a small cost, stands in quality as high as the Lake product, and for some purposes is even preferable. We believe that such a result has never before been attained: To produce with a single mine, which though systematically worked is only partially opened, about 3,000 tons of 18 per cent ores in a month, is certainly no small undertaking, and requires not only a good mine, but first-class management. We understand that the underground work is now being done in the most thorough manner, and that the development, which until recently was so far behind, is pushed with energy and skill, and that the showing in the mine is excellent. It is no less remarkable that the 3 furnaces should each average a daily capacity of over 50 tons of ore. We may well ask what Arizona's copper production would be if other fine copper properties in Globe district were developed and made productive? With a railroad and consequent cheapening of fuel, this district would become the greatest copper producer in the west. Unlike Montana copper, the product of our mines and smelters is almost chemically pure and adapted to almost every purpose for which copper is used. The Old Dominion Co. is at present the only live institution in this district; it has lived through all sorts of drawbacks and difficulties and is to-day more prosperous and promising than at any time in its past history. The company can be congratulated for the manner in which its affairs here, are handled, as the present successful showing is due in a great measure to wise and efficient management of the mine and smelting works. This company is the life of Globe, but it should not be alone in the field when there are so many other good mines in the district—not only copper but silver mines also. Globe is pre-eminently a mineral district; many and powerful indications prove this beyond doubt. We have gold, silver and copper mines awaiting common sense, judgment and capital to development and make them productive. We possess every reasonable facility for success excepting rail communication with the great arteries of commerce. This is our most urgent want, and citizens desiring the prosperity of our town and county should do everything possible to encourage and foster such enterprises, and not handicap them by an illiberal spirit calculated to cripple their operations. There is no reason that the present stagnation should forever continue. We want a railroad, competent men, with sufficient capital, to develop our mines, and financial success is assured.

QUIJOTOA.—Arizona *Citizen* Oct. 30: It was the good fortune of the *Citizen* man to pay a visit to the bonanza camp of the world this week, and, amid the excitement of a political campaign, to turn for a refreshing moment to a contemplation of nature's great treasure vaults now being unlocked for the first time by the golden key of the bonanza kings. It was a stormy day, unfortunately, when the scribe made his visit, and to this fact alone he attributes his disappointment in not traversing the deep tunnels that penetrate the enormous ledges of Mount Ben Nevis, for it is a long and tiresome journey up the rugged hillside even on a dry day, but it is doubly so and contains a spice of danger when the ground is filled with moisture. The 30 tons of machinery for driving the Burleigh drills has arrived at the mines, and the work of erecting will at once begin. It is estimated that about six weeks time will be consumed in this work, after which the initiatory steps will be taken for erecting the mill. A double compartment shaft will be sunk at the company's well, four miles away, and the water will be forced by heavy pumps to the mill. The reporter accidentally "dropped on" on a piece of gratifying news while there, that was intended to remain a secret for a short time, but which, as a faithful chronicler of reliable information and newsy facts, he feels duty bound to make public. In the weekly mining report of Superintendent Smith, of Oct. 18th, he stated without any flourish of words or hurrahs that Peerless tunnel No. 1 was in 324 ft; at 312 ft it had cut the vein, passing through a well defined foot wall and that the ore was good. That is to say, one week ago they had penetrated the vein 12 ft without reaching the hanging wall. They have, since that time, been steadily pushing through that vein and have not yet reached the wall! This vein is not only inconceivably wide, but the ore gives assays that will astonish the mining world.

COLORADO.

EMPIRE ITEMS.—Georgetown *Courier*, Oct. 31: Barrett and Fletcher have commenced freeing the old Tenth Legion from water, and expect to have it out in 10 days. It will probably take them three weeks to reach the bottom of the old shaft. We think they will see something then. Judge Romhauer's men are still driving away at their sluices, under the direction of that old California sluicer, Amos Morse. We learn nothing definite about the Big Chief mill being moved to Empire. Time and the further development of the mines and new discoveries may yet prove the mill to be in the right place. You may look for astonishing news from the north slope of Lincoln mountain soon. Frank Markham & Co. are opening several lodes that certainly show well. They have a 100-ft adit on the Hidden Treasure which shows from 4 to 5 ft of quartz mixed with galena and horn silver all through the crevice, and is improving with each day's work. They have a drift about the same length on the Lucky lode showing some very rich mineral. Geo. L. Black and Dr. Elliott are working an adjacent lode which looks well.

RUSSEL GULCH.—Colorado *Miner*, Nov. 1: Judge Klein & Son, leasing on the Charter Oak, received $17 per ton for their last lot of ore, and they threw up the lease. The pool working the Delaware mine have suspended operations. The large amount of water and hard rock discouraged them. Mr. Charles Hacker and Hazard Bros. have struck into some rich dirt in Nevada gulch. Some very fine nuggets have been found. Henry Sterns, Mellor & Co., leasers on the Virginia lode, have suspended work. This is a valuable piece of property, and should not lie idle. Frothere and Harris have commenced to sink the winze in their tunnel. The ore looks as fine as ever and they have a large amount in sight.

NOTES.—Extensive work is being prosecuted on the Seven-Thirty mine. The Moore & Co. lease on the Joe Reynolds is still more than holding its own. The Centennial mine has now eight ft of ore in sight which nets $32 per ton. There is an increase in the output of the Pelican and a slight increase in grade. Buckhorn, on Sherman mountain, is putting out ore which mills 300 ounces silver. The lessees on the Fulton have a fair streak of good-looking ore, which will be tested shortly. The water has been gotten out of the Terrible shaft, and work resumed on the 14th level east, with good indications. A great deal of ore was shipped from the Mendota mine last week. Phillipo and party shipped a lot of 35 tons, netting them $35 per ton. A new prospect on Kelso mountain is producing 100-ounce silver ore, with 30 per cent lead. Messrs. Evans and Fisher discovered it. The Cory City mine is developing into a full-fledged bonanza. The last mill run gave 265 ounces silver for first-class, and 183 for second-class ore. Peterson & Co., leasing on the Mendota, had a run made last week, which milled 354 ounces silver for first-class, and 111 ounces second class, running also high in lead. McCrea & Co. are drifting and stoping on the 150-ft level of the Murray mine, and have over two feet of scattered copper ore, in streaks of two to six inches solid. Donat & Engler have sunk a shaft between the engine, and whim shaft on the Murray mine, and have a solid six-inch streak of yellow copper, the best ore in the mine. Messrs. Chaffee, Rodgers and Francis had a run of 28 sacks last week from their new discovery on Kelso mountain, which ran 86 ounces of silver to the ton. E. J. Moore, of London, England, has purchased a third interest in the Wild Goose lode, on Irwin peak. Arrangements are now making to prosecute work on this property during the winter. Tom Schuler, on the Schurz lode, M'Clellan mountain, is down a distance of 60 feet, and has two veins of mineral—one two, and the other three inches in width, which yield 135-ounce silver ore. Hart & Chapman, on the 60-ft level of the Murray, and just above McCrea & Co., have a body of copper ore. The streak is not so large as on the lower level. The indications are that a large body of ore is ahead. Thirteen thousand dollars was taken out just west of this lease two years ago.

IDAHO.

THE LOST RIVER REGION.—Wood River *Times*, Oct. 31: A gentleman who recently paid the Lost River country a visit furnishes some interesting news from that section. Ranches in the Big and Little Lost River valleys are fast being taken up by industrious farmers, though as yet the country is but sparsely settled. Every farmer has at least a small patch of grain that has yielded abundantly, and the oats crop was especially good. The Lost River mining district is making a good showing this season, and promises at no distant day to rank among the leading base-metal producing sections of the Pacific slope. Some of the prospects already developed show every evidence of permanency, and some of the ore produced is of a high grade, yielding several hundred dollars in silver to the ton. The Daisy Black, in Hamilton district, beyond Little Lost River, may be taken as a fair average of the mines in that region. The lead is about eight ft by ten, and the ore from face to face will average about 40 ounces of silver and 50 per cent lead to the ton, while small veins through the ledge will assay well into the thousands. The wall-rock is lime and white sandstone. In fact, the mining section of that region seems to be generally of a lime and sand formation, and the ledges of ore-producing rock are well defined and may be traced for miles between these walls. The cost of mining is almost inconsiderable compared to most sections of the country, and this fact alone will greatly enhance the value of the properties. In several instances experienced men have offered to contract to take out ore from some of the prospects at the rate of $2 per ton, but owners have not been developing their properties, as they are awaiting the arrival of the smelter, which will be in operation in a few weeks.

BAYHORSE.—Idaho *Messenger*, Oct. 28: This camp is in its glory—nothing but success is attending everything and everybody. The mines are yielding almost beyond belief that have ever been productive and there are new ones struck almost daily. If our citizens desire to see the fine ore from a number of new strikes, they have only to call at this office and be convinced that Salmon River is the grandest country in the world for mining, and that Bayhorse is one of its chief tributaries. As is always the case, we have spent a few very pleasant days there, and see that their prosperity is beyond the power of tongue or pen to adequately describe. There is no camp in Idaho where everyone, or the great majority are so hopeful; or where the people are making so much money and still have such a bright future immediately before them.

MONTANA.

LITTLE ROCKIES.—Helena *Independent*, Oct. 30: Mr. H. H. Asbury, an old prospector who has been in all the mining stampedes for the last sixteen years, on his return from the Little Rockies was met by an *Independent* reporter, and the following information obtained: "I started from Helena the 25th of September, and outfitted at Fort Benton, taking the Cow Creek road from there to the seat of excitement, where I arrived in eleven days. I prospected in the Little Rocky gulches and got as high as 30 cents to the pan. Little Rocky Gulch proper is three miles long. There are places in it where the bedrock is washed bare for 300 or 400 ft as a stretch. The general formation is porphyry. There are from 18 to 20 men at work in this one gulch. In the entire mining district there are all told from 80 to 100 men." "Are they increasing or decreasing in numbers at the present time?" asked the reporter. "Well, it is about a stand off. They are going and coming out, the one about the same as the other. As near as I could find out there was a very general opinion that there is 'nothing in it.' This lack of confidence, I might just as well say, is universal. I do not think there is a single claim in the mountains that is paying." They sunk one hole 55 ft deep and had no return. A drain on People's creek about 9 ft deep was sunk and got a few colors. Now there is no one on the creek, and it is utterly deserted. It is reported that $130 were taken out in one day in Little Alder Gulch, but I cannot say as to its truth. As an example of the amount of gold held by different camps, I will say that $40 was all that could be found in one entire camp. It has been reported that there are traces of diggings made there a number of years ago, say in the 60's, but I could not find any such evidence. The mountain sits in the midst of a large plain, and branches off from one common peak in all directions; and right here are two difficulties: First, there is no water to wash out the gold except what melts from winter's snow in the spring; and second, in the heads of the gulches where it would be washed down there is no gold at all. For this reason I cannot see how there can be any paying mines when there is no gold to be washed down. Without gold and without water even if they had gold) I cannot see how they can amount to anything. It is a very easy matter to prospect. I have been on the topmost peak and looked for miles in all directions. One can ride around the entire mountain in a day, being but 50 or 60 miles around it. There was neither wash, boulder nor quartz, but pieces of galena from the size of a marble to that of an egg. "What reason can you give for creating this senseless stampede?" "Well, they have a good grazing country and they wish the reservation thrown open to settlers. By bringing people into the country, they will advertise it in other particulars, though they curse it as a gold find. Washington Territory did this same thing with regard to the Coeur d'Alene excitement and gained by it in this way. I know of real estate men in Spokane Falls, for example, who had the Coeur d'Alene *Miner* printed and sent out for this purpose. For this reason it will doubtless end in good to some one."

THE ANACONDA.—*Inter-Mountain*, Oct. 30: The most important news in mining circles during the past week is the reported resignation of Mr. Wm. McCaskel from the superintendency of the Anaconda smelter, and his contemplated removal to another sphere of action. Mr. McMaster, who has for many years successfully managed the company's vast gold mining interests in the Black Hills, has been compelled to retire, owing to bad health, and Mr McCaskel has been appointed to fill the vacancy thus made. Mr. Daly, though general superintendent of the mine and smelter, had little time to devote to the active personal management of the latter during its process of erection, but now is given the added responsibility of personally directing all the company's operations in Butte and Anaconda. In the person of Mr. Chenhall, who will have direct charge of the smelter, he has a competent and energetic assistant, who may be relied upon in all emergencies. Mr. Chenhall, though yet a young man, has built a half dozen copper works and renovated or reconstruction as many more. Matte shipments have already begun, the mine is in magnificent shape to insure a continuous and economical production, and the Anaconda mining and smelting enterprise, the most stupendous of its kind in the world, may finally be said to have begun its destined great career.

DEER LODGE.—Cor. Butte *Miner* Oct. 30: The placer mines at Pioneer, near here, are turning out gold in good paying quantities. Your correspondent saw a lump of gold from there the other day valued at $3,900. It came from the claim owned by Messrs. Irvine, Hazen & Kelley. Considerable interest of late has been manifested in the Cariboo district, where, it is reported, the richest quartz ledges exist. This camp is about 12 miles from Deer Lodge, and promises to be very lively next spring. A lode belonging to E. P. Mills, James Curns and two others show up in good shape. It assays away into the hundreds per ton, and has a breast of three feet of that character of silver ore. Parties have offered to bond it for 60 days for $50,000, but as yet the business has not been consummated, if it ever will. The fortunate owners are in no hurry to dispose of their property, believing they have a regular bonanza, and they evidently have.

GLENDALE ITEMS.—Dillon *Tribune* Oct. 30: Today (Saturday) is pay day and the boys received from the old reliable Hecla Company, $50,000. Furnance No. 3 is up and as soon as the brickwork is thoroughly dry it will be fired. It just consumed 19 days from the time the castings arrived at Melrose to the day of completion. Wednesday morning at 2 o'clock the smelter was closed down for general repairs. It will consume fully one week to do all the necessary work about the furnaces and machinery, no stoppage having been made for repairs during the 12 months past. On Oct. 1st the Hecla Consolidated Mining Company paid its monthly dividend of one per cent, or $15,000. Mr. Knippenberg believes in making both stockholders and employes happy. He certainly has succeeded well in doing both since he struck the camp in 1881. Manager Knippenberg has just issued a very stringent order regarding loafers and loafing about the smelter. Hereafter any man not on duty found loafing in or about the smelter, without a written order from the office, will be regarded as a trespasser and will be dealt with accordingly.

THE ORO FINO MINES.—*New Northwest*, Oct. 31: During the past week more interest has been manifested in the Oro Fino (or perhaps better known as the Caribou) quartz mines than ever before. The strike on the Champion directed attention to it, and numerous persons interested in quartz mining have since extended their investigations to other lodes with gratified surprise at their strength and character. Doc. Rains visited several and has taken a large number of samples to Butte for assay. Of one lode showing a large body of ore, he said it would justify the erection of a mill if it only yielded $15 to the ton. On Wednesday, Mr. Cleveland, associated with Mr. Wallace in the Dexter mill, visited the Champion and took samples of the ore for assay, with a view to buying or bonding if results proved satisfactory. The Forlorn Hope Company, which a year or two ago expended $1,400 in sinking a shaft which it is believed never reached that lead, again set men to work this week on its property. A number of new prospectors, some of them presumably associated with persons of means, have begun explorations in the camp and those who have stood by it for years feel much encouragement in the prospect of capital having its attention directed actively to this very promising field. We do not desire to create or encourage any unfounded excitement, preferring to see the camp attain prominence by its actual merits on development, but we would not be surprised if the Oro Fino mines would prove a strong rival to those of Butte.

NEW MEXICO.

SMUGGLER.—Silver City *Enterprise*, Oct. 30: Some time since a very favorable mention was made of the Smuggler mine in the Mogollons, at that time being developed by A. Andreas, a part owner. Since that time a shipment of ore has been made, the returns of which proved very satisfactory to the principal owner, Mr. George Biggs, one of the cattle kings of Wyoming. An expert, Prof. L. Twalle, was sent to examine the property, and his report was so favorable that the owners have decided to commence work on a more extensive scale. In a few days about 25 men will be put to work on the property, and no doubt in a very short time the Smuggler will be considered one of the paying mines of the Mogollons. We will watch the future development of this mine with great interest. We learn from J. W. Fleming, who has just returned from the Great American mine in the Swisshelm mountains, that every day's work shows up the property to a better advantage. Matt. France, superintendent, has had about 200 assays of ore made on the ground which give an average of over $100 per ton for every pound of ore taken out. Mr. Fleming does not hesitate to pronounce it, in his opinion, one of the largest mines in the Southwest. Steady shipments are being made to Denver of ore that was taken out previous to the sale of the mine by Messrs. Fleming, Clark and Sherwood to the Colorado Springs gentlemen who have interested themselves. The ore is hauled to Wilcox and shipped to Denver at a cost of $9.50 per ton and will average between $150 and $200. Men are daily employed, the force at present having been increased to about 40 men. A Malone correspondent of the Lordsburg *Advance* says: "We have in this camp 18 mines that can furnish $100 rock from the grass roots. We all intend to ship ore, for we are satisfied we can make money by so doing. I am shipping two carloads of ore that will average $200 per ton. Our camp is growing steadily, and we were convinced from the start that it would soon become a town of note; consequently we did not 'whoop her up' at the start, for we were satisfied that time would show the wide-awake world that we could compete with other camps. We have now a postoffice, one saloon, a hotel, several dwellings, and in the course of a month, our town will grow to double its present size. If anyone doubts my statement, he can by coming to our camp judge for himself. I can show him one claim with four leads on it that will assay over $100 per ton at the grass roots; 17 other claims will do the same. A depth of 50 ft only shows an increase in richness."

UTAH.

THE WEST SIDE.—There is not much stir in mining matters on the West side at present, though mines on which work is being prosecuted look better than ever. Bill Mahoney and Dan Kelleher are pushing the Baltimore tunnel. From the appearance of the material now in the face of the tunnel and its similarity to ledge matter accompanying the ore body in the shaft, the boys are nearing ore. This is the object for which the tunnel was first started, the ledge in the shaft pitching into the hill necessitated the driving of the tunnel farther than a perpendicular line from the shaft would call. They are now in 400 ft and gain nearly 30 ft in depth on the ledge. Over 40 tons of ore was shipped from this mine, and as it is accessible by teams from the valley, the cost of transportation is comparatively light. The ore averages 60 ounces silver and 45 to 50 per cent lead, through a good deal of it shows much higher assays. The owners expect, from the character of the rock worked in, to strike the ore inside of 50 ft. Mr. Grace is doing royal work on his gold claim near Lober's canyon. Some of the rock from this ledge shows gold in large quantities, and we expect to record a strike in that vicinity soon. The Morrison boys are working their Colburn mine in Copper gulch, and reports from there are very encouraging. There is a large shipment of ore on the Snort and Virginia dumps, awaiting the arrival of Hon. A. G. Campbell to be sent to market. This is very high grade ore. The Mastodon, adjoining the Snort, looks like a huge bonanza. The croppings on those mines can be easily traced for miles, and it the seeming indifference of the owners could be once overcome, valuable properties and large quantities of high-grade ore would soon follow.

THE SOUTHERN DISTRICT.—Southern Utah *Times* Oct. 31: Standing on the summit of the San Francisco mountains and looking east at this season of the year, mine owners of this region become well satisfied with their surroundings. The Wasatch range looms up in its winter garb, while not a speck of snow can be found within miles of our own district. Snow never has impeded mining matters in the vicinity of Frisco, while the miners of the Cottonwoods are already preparing to light out to a more congenial, if not safer clime. The fate of those who had lost their precious lives in the snow-clad peaks of the Wasatch, the thousands of dollars' worth of property swept out of existence annually, cause miners and capitalists to seek those sections in which mining can be conducted with some degree of safety the whole of the year through. Such advantages are presented just now by the San Francisco district. There is not a more genial climate nor a richer region to be found in all Utah, and at this particular crisis in the mining history of the West, the opportunity for profitable investment here may not occur again for years. The Horn Silver mine, as has often been set forth, pays over 50 per cent per annum on the market value of its stock. There are scores of mines now partially developed in the immediate vicinity of this great ore body, any one of which will, after a moderate outlay for machinery, show up as good a record.

ALASKA.

THE MINING INTERESTS.—Cor. Virginia *Enterprise*, Nov. 4: I think that mining will soon take the lead. So far very little well-directed prospecting has been done. The whole country, or nearly so, is covered with moss and a small, thick growth of timber, making it impossible to see the character of the ground you are traveling over, or of distinguishing quartz from slate. The general formation of the country is slate turned up on edge. Quartz is found in great abundance on all the islands and on the main land. It will require time, money and very hard work to explore and prospect any considerable portion of Alaska. I think, however, it will be done in time and abundantly repay the prospector. Douglas island alone is worth more now than all the whole country cost the United States, and there is every reason to believe that other mines as good exist and will be found in many other parts of the country.

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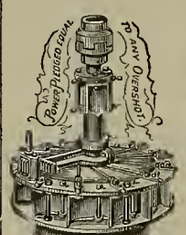

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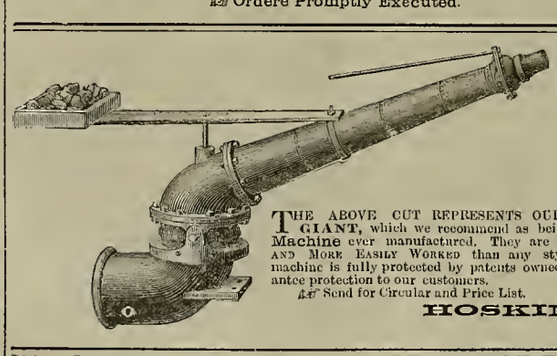

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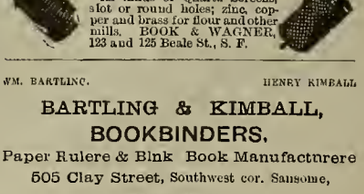

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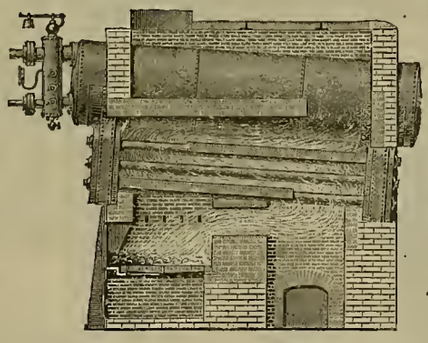

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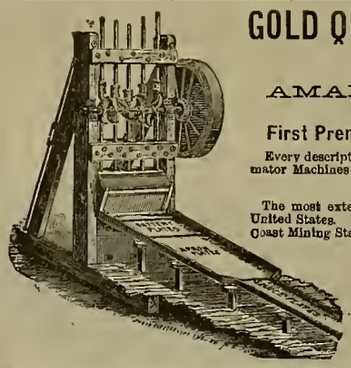

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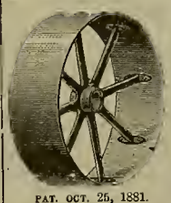

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For Best Hoisting Engine and Boiler Combined.

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List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.]

FOR WEEK ENDING OCTOBER 24, 1884.

307,164.—LINE INDICATOR FOR TYPE WRITING MACHINE—E. S. Belden, S. F.

307,173.—LINING FOR CHIMNEYS—Jere Browell, S. F.

307,174.—GOLD SAVING APPARATUS—Brown & Field, Byron, Cal.

307,376.—LIFTING JACK—W. J. Butler, Salinas, Cal.

307,182.—SHIRTBAND AND COLLAR—W. B. Daugherty, Carson, Nev.

307,288.—CUTTING CHANNELS IN WATER WAYS—John Gates, Portland, Or.

307,280.—WORKING SUBMARINE HARROWS—John Gates, Portland, Or.

307,406.—LAMP CHIMNEY—C. N. Miller, San Rafael.

307,415.—ENGINE LUBRICATOR—W. H. Thomas, Los Angeles.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise), at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

OVERSHOE.—Henry O. Hooper, Fresno, Fresno Co., Cal. No. 306,830. Dated Oct. 21, 1884. It consists in an improvement in the counter of the overshoe, the object of which is to prevent the overshoe from slipping from the heel or counter of the inserted shoe. The improvement consists in a suitable spring placed in the counter of the overshoe, adapted to bend on the counter or heels of the inserted shoe and prevent slipping.

SAW JOINTER.—John Entsler, Wallace, Calaveras Co., No. 304,631. Dated Sept. 12, 1884. The object of this saw jointer is to put in line the cutting edges of the wedge-shaped points of the teeth of a saw to make it run true, and it consists in a frame having an adjustable clamping device for securing the file and adjustable plates or bars for receiving and guiding the saw over the file.

BELL-PLATE AND CARD-RECEIVER.—John C. Mattheis, Alameda. No. 306,846. Dated Oct. 21, 1884. This device, which the inventor calls a bell-plate and card-receiver, consists of a metal plate adapted to be attached to a door, having an opening through which the bell handle projects, lugs, between which it is pivoted, springs, upon the face of the plate to hold cards, and a tablet inserted upon the face of the plate, upon which a name or a card may be written. The device provides a ready and convenient means for leaving a card or message when the occupants of the house are not at home, or for leaving letters in safety until they can be removed.

GREASE TRAP.—N. J. Whiting, S. F. No. 306,981. Dated Oct. 21, 1884. This trap is intended to be applied to the discharge pipe of sinks, etc., and is specially designed to separate grease and sediment from the water, and collect it in a body so as to be otherwise disposed of, while allowing the water to escape without being loaded with substances which would tend to choke and clog the sewers. It consists of a box or chamber having a perforated partition or partitions extending across its interior, and upwardly from the bottom, the inlet pipe opening into the chamber at a point below the surface of the water, and a curved outlet pipe extending from near the bottom of the chamber to any required hight inside; thence through the side of the chamber and to the sewer or drain, and in connection with said outlet pipe, the air-vent to prevent siphonage, together with the discharge pipe and stop cock opening into a chamber close to the bottom, so that all the material may be drawn off when required.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
J. J. BARTELL—Sacramento County.
A. C. KNOX—Nevada State).
GEO. MCDOWELL—Alameda and Santa Clara Counties.
WM. PASCOE—San Francisco.
WM. H. COOK—Los Angeles County.
H. G. PARSONS—Montana and Idaho.
G. W. INGALLS—Arizona.
D. K. BRAMBLE—Humboldt and Del Norte Counties.
W. WHITWELL—Oregon.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AMT. LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M & M Co	Alaska	8	70	Oct 14	Nov 15	Dec 5	E F Stone, 306 Pine st
Andes M Co	Nevada	25	25	Sept 23	Oct 28	Nov 20	B Burris, 309 Montgomery st
Butte Creek Hyd M Co	California	10	10	Sept 23	Nov 6	Nov 29	R L Taylor, 230 Montgomery st
Caborca M Co	Mexico	9	03	July 18	Nov 1	Dec 1	C Bovie, 328 Montgomery st
Chollar M Co	Nevada	15	50	Oct 29	Dec 2	Dec 23	C L McCoy, 309 Montgomery st
Con Va & California M Co	Nevada	1		Nov 5	Dec 13	Jan 3	A W Havens, 309 Montgomery st
Crocker M Co	Arizona	1		Oct 31	Dec 2	Dec 23	A Waterman, 309 Montgomery st
Daisy Cement M Co	California	2	02	Sept 26	Nov 3	Nov 29	C J Collius, 512 Montgomery st
Day S M Co	Nevada	15	75	Sept 26	Nov 3	Dec 2	E M Hall, 327 Pine st
Gould & Curry S M Co	Nevada	49	50	Oct 25	Nov 29	Dec 22	A K Durbrow, 309 Montgomery st
Golden Fleece G M Co	California	34	40.00	Oct 13	Nov 18	Dec 8	F Schirmeier, 412 Sixth st
Indian Spring Drift M Co	California	3	05	Sept 17	Oct 18	Nov 15	A B Paul, 328 Montgomery st
Lamphire G M & M Co	California	1	10	Oct 3	Nov 17	Dec 8	A Martin, 526 Montgomery st
Peerless M Co	Arizona	2	25	Sept 25	Nov 3	Nov 29	A Waterman, 309 Montgomery st
Rainbow M Co	California	12	15	Oct 24	Dec 1	Dec 29	F F Marhardt, 311 Montgomery st
Standard M Co	California	1	25	Oct 17	Dec 1	Jan 5	W Willis, 309 Montgomery st
Sierra Nevada S M Co	Nevada	80	50	Oct 22	Nov 26	Dec 25	E L Parker, 309 Montgomery st
Solid Silver M Co	Nevada	4	15	Sept 23	Oct 25	Nov 12	R Hewson, 5 First st
Sterling M Co	California	1	05	Sept 18	Oct 23	Nov 20	W H Allen, 306 Pine st
Tunitas Petroleum Co	California	2	1.00	Sept 29	Oct 31	Nov 15	S F Springer, 601 California st
Utah S M Co	Nevada	51	50	Oct 23	Nov 28	Dec 16	G C Pratt, 309 Montgomery st
Union Con M Co	Nevada	28	50	Nov 5	Dec 9	Dec 30	J M Bullington, 309 California st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Challenge Con M Co		C L McCoy	309 Montgomery st	Annual	Nov 20
Bonanza King M Co	California	D C Bates	309 Montgomery st	Annual	Nov 12
Fremont M and M Co		M T Ashby	402 Front st	Annual	Nov 11
Hamburg M Co	Nevada	D A Jennings	401 California st	Annual	Nov 11
Toboggo M Co		J L Fulda	330 Pine st	Annual	Nov 13
Peck M Co	California	C T Bridge	224 California st	Annual	Nov 20
Western Belle M Co	Nevada	J H Sayre	330 Pine st	Annual	Nov 11

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	G W Sessions	309 Montgomery st	50	June 5
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Oct 8
Idaho M Co	California			4.00	Apr 2
Jackson M Co	California	D C Bates	309 Montgomery st	10	Mar 16
Kentuck M Co	Nevada	J W Pew	310 Pine st	10	July 21
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Oct 29
Standard Con M Co	California	Wm Willis	309 Montgomery st	25	Mar 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Nov 6

San Francisco Metal Market.

[WHOLESALE.
THURSDAY, Nov. 6, 1884.

ANTIMONY—Per pound	@	—
Hallet's	13 @	—
Cookson's	14 @	—
BORAX—Refined	7½@	8
IRON—Glengarnock ton	25 00 @	—
Eglinton, ton	24 00 @	—
American Soft, ton	25 50 @	—
Oregon Pig, ton	@	—
Clipper Gap, Nos. 1 to 4	30 00 @	32 50
Clay Lane White	22 00 @	—
Shotts, No. 1	26 00 @	—
Refined Bar	3 @	5½
Boiler, 1 to 4	5 00 @	5 50
Plate, 5 to 10	4½@	4¾
Nail Rod	7 @	—
Norway, according to thickness	6 @	7
STEEL—English, B.	16 @	25
Black Diamond, ordinary sizes	13 @	—
Drill	15 @	—
Machinery	12 @	14
COPPER—Ingot	14 @	15
Braziers' sizes	7 @	37
Pig, 30 sheets	28 @	—
Bolt	23 @	25
Bar	— @	—
Cement, 100 fine	12 @	—
Copper in New York, Nov. 5	12¾@	—
LEAD—Pig	3¾@	4
Bar	5½@	—
Pipe	7 @	—
Sheet	8 @	—
Shot, discount 10% on 500 bags: Drop, ¾ bag	1 85 @	—
Buck, ¾ bag	2 05 @	—
Chilled, do	2 25 @	—
TIN PLATES—Charcoal	5 25 @	7 25
Coke	5 75 @	6 75
Pig	19 00 @	20 00
Banca tin	22 @	23
I. C. Charcoal Roofing, 14x20	6 25 @	6 50
ZINC—German	9 @	10
Sheet, 7x3 ft. 7 to 8 lbs., less the cask	9 @	10
QUICKSILVER—By the flask	30 00 @	—
Flasks, new	1 05 @	—
Flasks, old	85 @	—

Mining Share Market.

Business in the stock wards has been demoralized during the past week, political matters taking up the times of speculators and the public. Those interested hope for some revival in mining stock matters, now that the election is over. On the Comstock, at the north end they are starting in on some very interesting work on the 3000 level of the Sierra Nevada. Also, of course, there is the deep work on the 3300. This is of great interest to all mining men. The Ophir, and the folks of the old bonanza mines are going before to solve a very interesting problem, in regard to the working of the old upper levels. At Gold Hill they are taking out a great deal of money every week, but it is in no way connected with the grand skirmishing of the market. Down at the south end, the trouble is water.

DEATH OF SAMUEL SEABOUGH.—A journalist widely known and universally respected was Samuel Seabough, who died in San Francisco this week. He was one of the oldest newspaper men on the coast. For a long time he was editor of the *Sacramento Union*, and has been identified with many papers—at one time with the *Evening Bulletin*. At the time of his death he was an editorial writer on the San Francisco *Chronicle*. He was a modest man, whose best work was done in a silent manner on the various journals with which he was connected. He was the founder of a remarkably good weekly in "56 times" at San Andreas with Armor and Clayes, but left the paper a year or two later. Since then his pen has been active and one of the ablest on leading dailies in California. Probably no other man has written a greater number of incisive leaders than himself. His friends remember him with honor and kindness, for he belongs to a class of almost personally unknown workers, who influence and do the community a hundred fold more good than the ninety-nine whose names are daily blazoned forth as the enterprising men who are gloriously moving the world along. Mr. Seabough was a man of great and varied information and of splendid qualities of intellect and heart.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 16.		WEEK ENDING Oct. 23.		WEEK ENDING Oct. 30.		WEEK ENDING Nov. 6.	
Alpha	....	1.25	1.25	1.40	1.15	1.45	.50	1.10
Alta	1.65	1.75	1.60	1.90	1.60	1.75	.85	1.35
Andes	....	.10	.05	.10	.05	.35	....	.30
Argenta	....	....	....	....	....	....	....	.05
Belcher	....	.80	....	.85	....	.75	.60	.70
Belding	....	....	....	....	....	....	....	....
Best & Belcher	1.75	1.85	1.50	1.80	1.70	1.90	1.50	1.70
Bullion	....	.25	.30	.35	....	.27	....	.20
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	.40	.45	.35	.55	.45	.50	....	.50
Bodie Con	2.10	2.20	2.10	3.05	2.70	2.80	2.05	2.75
Benton	....	.50	.50	.55	....	.45	.25	.35
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	....	.65	.55	.80	.65	.75	.35	.55
California	.35	.40	.35	.55	....	.45	.25	.40
Challenge	....	....	.20	.25	....	....	....	.15
Champion	....	....	....	....	....	....	....	.30
Chollar	2.00	2.15	2.00	2.50	2.30	2.50	1.95	2.25
Confidence	....	....	....	....	....	....	....	.80
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	.15	.20	.35	.40	....	.45	.25	.40
Con. Pacific	.80	1.00	....	.85	.85	.90	....	.90
Crown Point	....	1.30	1.35	1.45	....	1.40	.90	1.25
Oay	....	....	....	....	....	....	....	....
Eureka Con	3.10	3.20	2.10	2.75	....	3.80	....	2.95
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	....	.25	.10	.35	.20	.25	.05	.20
Grand Prize	.25	.35	.25	1.25	....	.15	.15	.20
Gould & Curry	1.25	1.20	1.00	1.25	1.10	1.30	.95	1.10
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	2.45	2.75	2.70	3.30	3.10	3.20	3.10	3.25
Holmes	3.95	4.00	3.00	3.25	....	....	3.40	3.50
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	....	.10	.20	.25	....	....	....	.15
Martin White	....	.40	....	.40	.40	.45	....	.40
Mono	1.50	1.65	1.50	2.00	1.60	1.70	1.10	1.55
Mexican	1.20	1.35	.90	1.20	1.00	1.15	.90	1.00
Mt. Diablo	3.25	3.50	3.40	3.75	....	3.60	3.50	3.80
Northern Belle	....	....	....	....	....	....	....	....
Navajo	3.60	3.65	3.85	3.95	3.80	3.90	3.75	3.80
North Belle Isle	....	.45	.50	.60	.45	.50	....	.45
Occidental	1.20	1.25	1.35	1.50	1.45	1.50	....	....
Ophir	.80	1.10	.75	.95	.80	.90	.75	1.00
Overman	....	.15	.15	.20	.15	.20	.15	.20
Potosi	1.00	1.10	1.05	1.50	1.20	1.30	1.00	1.15
Pinal Con	....	....	....	....	....	....	....	....
Savage	1.25	1.30	1.25	1.40	1.35	1.40	1.25	1.35
Seg. Belcher	....	....	....	1.00	....	....	....	....
Sierra Nevada	1.05	1.30	.85	1.25	.95	1.10	.80	1.00
Silver Hill	....	....	....	....	....	.05	....	....
Silver King	....	....	....	4.15	....	4.15	....	4.05
Scorpion	....	.15	.15	.60	.14	.15	....	.15
Syndicate	....	.50	.60	.65	....	.55	.50	.55
Tioga	....	....	....	....	....	....	....	....
Union Con	....	1.05	.80	1.10	.80	.99	.75	.90
Utah	.80	1.00	.60	.90	.80	.85	.55	.60
Yellow Jacket	1.65	1.90	1.70	1.85	1.80	1.85	1.60	1.80
	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Nov. 6.

100	Bodie Con		2.90
450	Alta	.95c	
350	Bulwer	.55c	
50	Alpha	.95c	
150	Benton	.30c	
500	Andes	.30c	
90	B. & Belcher	1.70	
1225	Bodie	2.75@2.90	
450	Con Va & Cal	.30c	
100	B. & Belcher	1.55	
270	Chollar	2.30@2.35	
300	Benton Con	.30c	
70	Crown Point	1.00@1.05	
130	Gould & Curry	1.10	
150	Con. Pacific	.95c	
2950	Hale & Nor	3.90@4.00	
50	Chollar	2.30	
20	Mexican	1.00	
323	Con Va & Cal	.25c	
20	Mono	1.30	
100	Day	.75c	
370	Navajo	3.75@3.85	
300	Justice	.15c	
100	N. Belle Is	.45c	
700	Hale & Nor	3.50@3.65	
50	Ophir	.85c	
80	Mexican	1.00	
30	Occidental	1.45	
300	Mono	1.55	
100	Potosi	1.15	
100	Ophir	.85c	
50	Syndicate	.55c	
300	Potosi	1.05	
200	Scorpion	.25c	
200	Sierra Nevada	.85@1.00	
150	Sierra Nevada	1.00	
220	Savage	1.35	
920	Savage	1.40@1.45	
75	Union Con	.80c	
800	Union	.85@90c	

AFTERNOON SESSION.

100	Yellow Jacket		1.70
1250	Alta	1.15@1.20	

PROGRESSIVE SCIENCE IN OPTICS.—There is no calling requiring such constant study as that of a first-rate optician, to whom the progressive developments of the present day continually present new difficulties and problems to solve. By close attention to his profession, and over thirty years' practical experience, C. MULLER, the well known optician, 135 Montgomery street, has gained for himself the gratifying distinction of being the leading optician of the Pacific coast. All complications of defective vision most carefully tested free of charge. Sole depot of Pebble Spectacles. 2

AN unusually fatal outbreak of cholera has occurred at Madras, which is aggravated by the difficulty of procuring provisions, as the terror-stricken villagers refuse to bring to the city the customary supplies.

The Concentrator Controversy.

At the request of the local agents of the Duncan concentrator, we gave space to the following communication from the *Engineering and Mining Journal*, of New York, in answer to the letter of N. McDermott, which was given in the PRESS of Oct. 25th, regarding the recent concentration test at the Carlisle mill, in New Mexico.

In your issne of September 6th you publish a letter by Walter McDermott, in which he comments at some length on the statements of Col. I. E. James, published in your issue of August 30th, in regard to a trial run, made in February and March, 1884, between the Frue vanner and Duncan concentrators, at the Carlisle mill, New Mexico. Mr. McDermott and other vanner agents bring forward the very plausible argument that, inasmuch as Frue vanners were at the time of said trial placed in the mill on trial, to be paid for if satisfactory, and returned if not, and as five additional vanners were ordered immediately after the trial of the said machines, and all retained, perforce Colonel James' actions belie his words.

The facts of the case are these: Experience had taught us that the Duncan concentrators we had in use, eight in number, were not of sufficient capacity to successfully handle the pulp from our 20-stamp mill, and on the representations of the Denver agent of the Frue vanners, that five vanners would work out all the tailings from all the concentrating machinery in use, and save therefrom a large amount of mineral, five vanners were taken on trial, on the conditions named in the contract. After they were duly put in place by the Denver agent, we tried them on the tailings from the Duncans, but found them incapable of handling the amount of material for which they were recommended. We thereupon made a trial run of the two machines on the same amount and quality of pulp from the batteries, with the result named in Colonel James' statement; but finding them to be good auxiliaries to the Duncans, and able to relieve those machines in a measure, and having them well set up and in good running order, I advised Colonel James to pay for and retain them, which was done, but has since been regretted, as the management considers that a less number of Duncans would have answered the purpose for which the vanners are employed, with better results and fewer attendants.

The five additional vanners were ordered by interested parties in Chicago, without consulting the management here, and are not in use, and have not been for a long time.

The gentleman makes a true statement when he says that it is possible to so run a vanner that a Duncan concentrator will give better results, and I do not hesitate to add that it is impossible to so run one that it will give better results than a Duncan on our ore.

Two other points about the test are noted and commented on—one, the relative cleanliness of the concentrates. The fact that those from the Duncan were the best, is looked upon as something miraculous, and an insinuation again added that the test was not fair. *But this point, as well as the gold-saving properties of both machines, can best be decided by watching them at work, and taking the results for your guidance.*

In reference to the saving of amalgam, quoted in the test, Mr. McDermott comes forward with the very lame excuse that the vanners were not ordered for this, which is true; but they were highly recommended for this purpose by the Denver agent. "And the copper plates, with one-half-inch rifles at top and bottom, for ordinary pulp distributor on vanner, . . . the most effective amalgam concentrator possible to conceive," in the language of Mr. McDermott, were furnished and put in position by the Denver agent, prior to the said trial, and proved a total failure in our case, and a hindrance to the good working of the machine.

He also jumps at the conclusion that the gold caught in the Duncan concentrators passes from the copper plates in globules of quicksilver, as if we used silver by the buckelful. Will the gentleman please know that we have ordinary intelligence in regard to using silver on copper plates for amalgamating purposes?

Yours respectfully,
W. E. STIRK,
Supt. concentrating department, Carlisle Mill,
Carlisle, N. M., Sept. 20, 1884.

[We trust this will close this controversy on the subject of concentration. We have given the various parties interested, an opportunity to express their views on the test referred to, as a matter of general news to the mining community, but do not care to see the controversy continue indefinitely, believing that it will drift rather into a debate, than a discussion of merits of the machines. We shall, however, be ready to publish the *results* of tests, provided no lengthy arguments for or against the respective machines accompany them.—EDS. PRESS.]

Bullion Shipments.

Navajo, Oct. 30, $14,323—for October, $57,531; Horn Silver, 28, $12,600; Ontario, 28, $3,635; Hanauer, 28, $3,650; Queen of the Hills, 28, $1,400; Wood River ore, 28, $1,300; Hanauer, 29, $4,750; Nevada ore, 26, $1,250; Horn Silver, 29, $9,000; Ontario, 29, $3,012; Christy, 29, $1,950; Hanauer, Nov. 1, $2,650; Idaho ore, 1, $2,750; Day, 1, $4,542; Hanauer, 2 $2,670; Queen of the Hills, 2, $2,500; Idaho ore, 2, $1,300; Ontario, 2, $11,780; Horn Silver, Oct. 31, $9,000; Horn Silver, Nov. 2, $6,000.

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Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some responsible party requested to stop it, we shall positively demand payment for the time it is sent.

S. F. VISITOR'S DIRECTORY.

For the convenient reference of our readers, and benefit of visitors to S. F. from the interior and abroad, we shall occasionally insert the following directory free. Officers of associations mentioned are invited to notify us promptly of any changes occurring from time to time

California Academy of Sciences.

Hall and museum, S. W. corner California and Dupont. President, PROF. GEORGE DAVIDSON. Secretary, CHARLES G. YALE. Regular meetings, 1st and 3d Mondays of each month. Museum open to the public from 9 A. M. to 5 P. M. on Mondays, Wednesdays and Saturdays. Museum embraces all classes of natural history specimens.

Crocker-Stanford Collection

This collection was presented to the California Academy of Sciences by Charles Crocker and Leland Stanford. It comprises a large number of specimens of minerals, casts and articles in all branches of natural history. Among other things are many of Ward's casts, including the monster elephants, mammals, etc. The collection is on exhibition at Mercantile Library Hall, 214 Bush St., and is open to the public every Saturday from 10 A. M. to 9 P. M. Chas. D. Gildess, curator.

California Pharmaceutical Society.

Lectures are given at the hall of the College of Pharmacy Fulton street, between Polk and Van Ness avenue, three nights each week, for a term of six months, in the summer

California State Geological Society.

Henry G. Hanks, President; S. Heydenfeldt, Jr., Secretary. Headquarters, State Mining Bureau, 212 Sutter St.

Geographical Society of the Pacific.

Rooms, 413 Sutter St. President, George Davidson; Secretary, C. Mitchell Grant. Meetings, 1st and 3d Tuesdays of each month.

California State Mining Bureau.

Office and museum, 212 Sutter St. State Mineralogist, Henry G. Hanks. Open daily to visitors free, from 10 A. M. to 3 P. M. Museum comprises ores, minerals, rocks and natural products of the State.

Mechanics' Institute.

Rooms and library, 31 Post St. P. B. Cornwall, President; W. P. Stout, Recording Secretary; Horace Wilson, Librarian.

Peoples' Free Library.

Location, north side of Bush, between Kearny and Dupont. Librarian, Fred B. Perkins. Open from 9 A. M. to 9 P. M.

Mercantile Library Association.

Library, 214 218 Bush. A. E. Whitaker, Librarian. There are 52,000 volumes in the library. Reading room, with papers and magazines.

Technical Society of the Pacific Coast.

Hall, 413 St. President, Col. Geo. H. Mendell, U. S. A.; Secretary, Charles G. Yale. Regular meeting, first Friday of each month; extra meeting for discussion of papers, last Friday of each month

Society of California Pioneers.

Rooms, 308 Montgomery St. President, Nathaniel Holland; Secretary, F. Vassault. There is a library cabinet of minerals, relics of early times, and other objects of interest at the rooms. Regular meetings, first Monday of each month.

San Francisco Microscopical Society.

Rooms, 120 Sutter St. President, C. Mason Kluge; Secretary, E. J. Wickson. Meetings, second and fourth Wednesdays of each month.

University of California.

Location, Berkeley. Museum comprises the collection of the State Geographical Survey, the Pioche and Keene collections, and a large miscellaneous collection of the woods, ores, minerals, rocks, etc., of the Pacific Coast.

Golden Gate Park.

The Park may be reached directly by cable cars of the Haight St. or McAllister St. line, which run out Market and branch off at the streets named, for the Park, or by the Geary St. line. The Park is opened for visitors at all times.

Woodward's Gardens.

Mission St., between 13th and 14th. Reached by Folsom, Mission, Howard and Market St. cars. In the gardens are menagerie, museum, art gallery, aviary, aquarium, theatre, restaurant, etc.

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STOCKHOLDERS' MEETING.

Notice is hereby given that a meeting of the Stockholders of Fremont Mining and Milling Company will be held at the Company's office, No. 402 Front Street, Room 8, San Francisco, California, on Tuesday, November 11th, 1884, at 12 o'clock M., for the purpose of electing officers for the Company, and of acting upon a proposed amendment of the By-Laws of the Company, providing that vacancies in the offices of President, Vice-President, and Trustees, shall be filled by the Board of Trustees.

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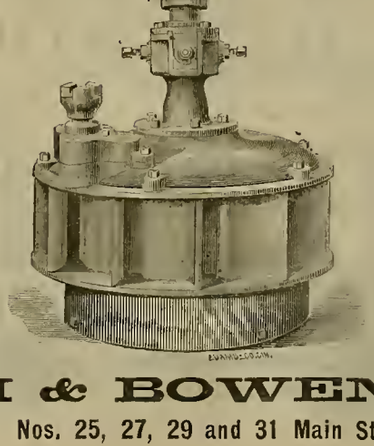

current is never changed, nor its velocity checked, consequently nearly the same per cent. of power is obtained with the gates only partially drawn as when fully open.

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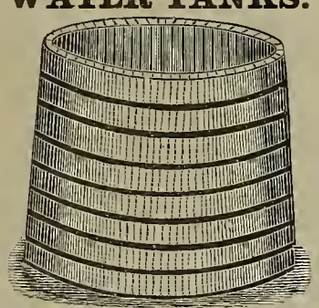
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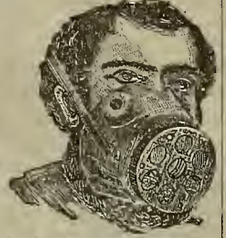
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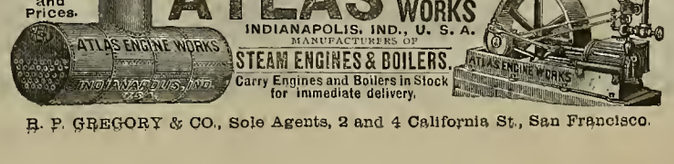

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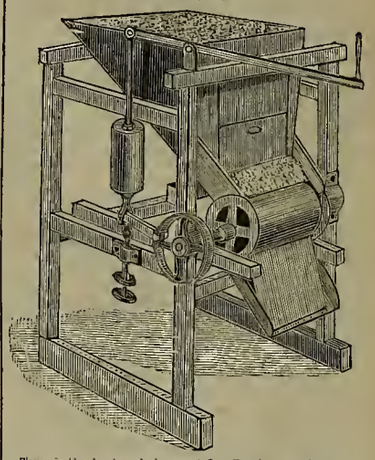
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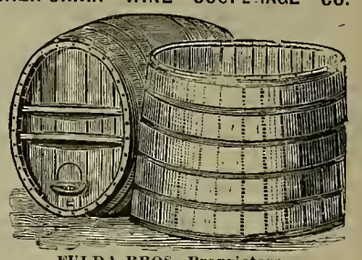
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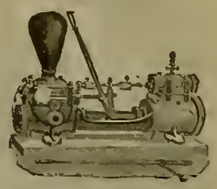
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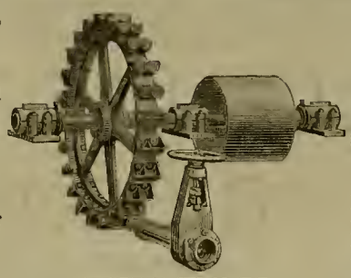

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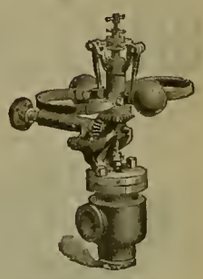

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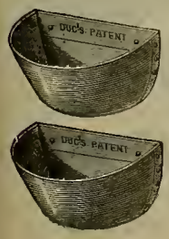

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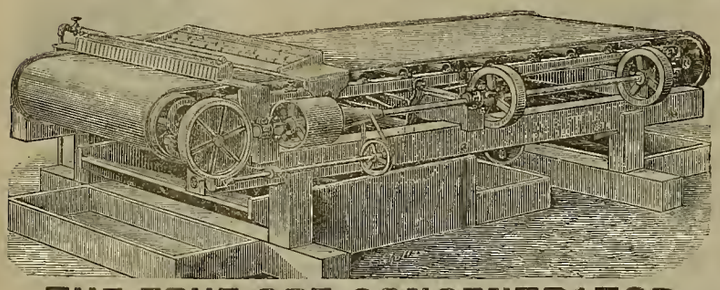


THE FRUE ORE CONCENTRATOR,
OR VANNING MACHINE.

PRICE: FIVE HUNDRED AND SEVENTY-FIVE DOLLARS, ($575 00), F. O. B.

OVER 1,000 ARE NOW IN USE. Saves from 40 to 100 per cent more than any other Concentrator. Concentrations are clean from the first working. The wear and tear are merely nominal. A machine can be seen in working order and ready to make tests at the Fulton Iron Works, No. 220 Fremont Street, San Francisco.

As the result of a suit East against an End-Shake Machine (the Embrey), similar to the Triumph, the Frue Vanning Machine Company owns the Embrey patent, and can put in the market an End-Shake Machine of earlier patent that will do as good work as the Triumph, and superior in construction and durability. There will be no risk of suit for infringement.

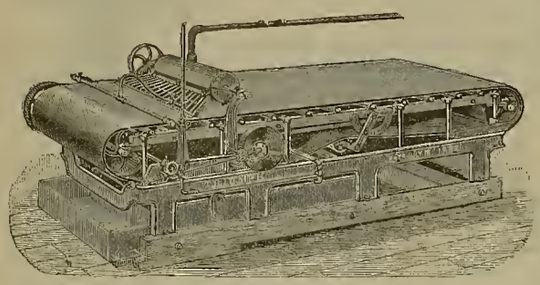
The Frue Vanning Machine Company warn the public that they claim and will prove the Triumph machine to be an infringement on patents owned by them.

Protected by patents May 4, 1869, Dec. 22, 1874, Sept. 2, 1879, April 27, 1880, March 22, 1881, Feb. 20, 1883, Sept. 18, 1883. Patents applied for.

N. B. We are and have been ready at any time to make a competitive trial against the Triumph, or any other Concentrator for stakes of $1,000.

ADAMS & CARTER, Agents Frue Vanning Machine Co.,
Room 7—No. 109 California Street, - - - SAN FRANCISCO, CAL.

$1,000 CHALLENGE ACCEPTED!



THE
"TRIUMPH" ORE CONCENTRATOR.

PRICE, FIVE HUNDRED AND FIFTY DOLLARS ($550.00), F. O. B.

THE "TRIUMPH" TRIUMPHANT!

In a competitive trial recently had between two of the "Triumph" Ore Concentrators and the same number of "Frue" Vanning Machines, at the mill of the celebrated gold producing Original Empire Mill and Mining Company, in Grass Valley, Nevada County, Cal., the "Triumphs" produced thirteen and fifteen one-hundredths (13.15) per cent more concentrations than did the "Frue" Vanners, during a run of twenty-four consecutive days, or a net gold coin result of $199.15, or $8.30 per day, in favor of the two "Triumph" Concentrators.

These returns do not include the value of the amalgam saved by the "Triumphs" during the test; which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarily saved, which is lost on the "Frue" Vanners.

This trial was conducted under the personal supervision of the Manager and Superintendent of that Company, in a strictly fair and impartial manner, and with the sole view of determining, in the interest of that Company, the merits and demerits of the respective machines by a thoroughly practical test. A relation of the course of procedure, a concise analysis of assays, and a tabulated statement of the net bullion results, with accurate deductions therefrom, will soon be published in Circular form.

The superiority of the present construction of the "Triumph" over the form originally introduced, together with the demonstrated results of the above, and other trials had with the "Frue" Vanners, induce us to and we hereby accept the Challenge of $1,000, flaunted by the Agents of the "Frue Vanning Machine Company," and hold ourselves in readiness to enter into a second competitive trial for that sum, at such place and upon such terms and conditions as may hereafter be mutually arranged.

We guarantee purchasers against all costs, expenses or charges incurred by reason of any infringements of any existing patents.

"Put up or shut up," and "Let the Best Machine win!"

JOSHUA HENDY MACHINE WORKS,
Nos. 39 to 51 Fremont St., San Francisco, Cal.

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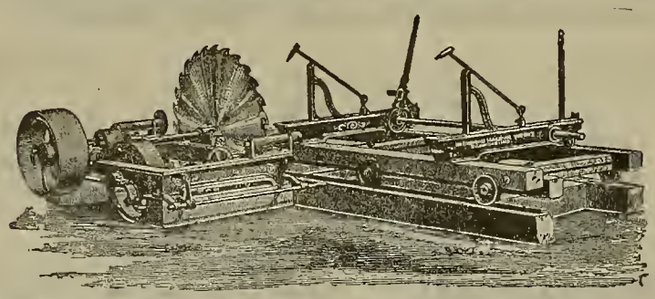

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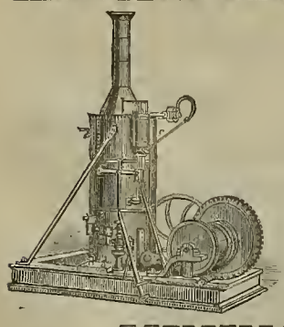

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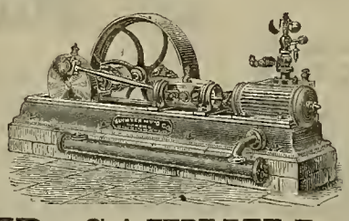

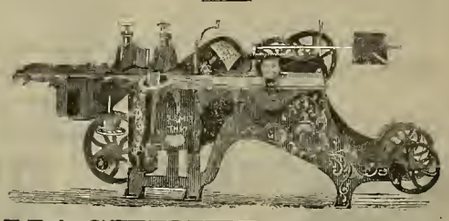

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AUTOMATIC ORE-FEEDERS, HENDY AND TRIUMPH CONCENTRATORS.

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Wilbraham Rotary Piston Pumps, Blaisdell & Co.'s Machinists' Tools.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, NOVEMBER 15, 1884.

VOLUME XLIX. Number 20.

The Bidwell Brake Shoe Holder.

Every user of buggies and spring wagons in a district where a brake is required and subjected to much use, has encountered the annoyance and difficulty in providing for the wear on the blocks. Leather is usually employed, but is not always at hand, with hammer and nails, to be tacked on. A metal surface is objectionable, on account of the wear on the tire, and the harsh, unpleasant noise produced. Another annoyance experienced is the tendency of the ordinary wooden block to turn round on the shank, or to wear unevenly on one end or the other.

It is with a view of overcoming the above disadvantages that the brake-block, or brake shoe holder, herewith described, has been devised by A. R. Bidwell, of Greenville, Plumas Co., Cal. It is also intended to provide something that is neat in appearance, and that will admit of readily replacing the worn-out shoe, and at a merely nominal expense.

In the engravings, *S* represents the shank of an ordinary brake-rod, with nut, *N*. The holder is of light malleable iron, and is cast in two halves, *A* and *B*, and provided with an "adjuster," *C*, as shown in Fig. 1. The shoe, *D*, is intended to be make of any convenient piece of wood, cut of the required width and thickness, and sawed into proper lengths, of which any carpenter will make a number of pairs for a few cents. These should be kept on hand, or an extra pair carried when a long trip is contemplated. By means of the flanges, *d*, and the toothed projections shown in the rear view (Fig. 2), the shoe is firmly clamped, and held between the two halves, when the nut, *N*, is screwed up. The back of the shoe should be straight, so as to bear on the points, *e*, *e*, *e*, and be supported by them, and also of such width as to just fill the space between the flanges, when the holder is together and the nut, *N*, screwed up (*D*, Fig. 1).

The two halves of the holder are free to turn on shank, *S*. At *s*, however, there is a square shoulder, which fits between the projecting flanges of the adjuster, *C*. By means of its slotted opening, through which the shank passes, the adjuster can be moved up or down within certain limits. This movement is sufficiently ample so that the curved points, *b*, *b*, of the adjuster, sliding between the correspondingly curved ribs, *a*, *a*, cast on the inner half of the holder, throw the top or bottom of the block to or from the wheel, as may be necessary (Fig. 1). By this means the shoe can at once be set so as to strike the wheel fairly and wear evenly. By loosening the nut, *N*, and separating the holder, the shoe is introduced, and sliding the adjuster to the proper point, the shoe is set in its required position. Screwing up the nut clamps the shoe, and also binds the adjuster, so it cannot move up or down on the shoulder, *s*, and therefore the block is securely kept from turning or getting out of adjustment by the points, *b*, *b*, and ribs, *a*, *a*. The use of leather, if preferred, is facilitated by this holder, as it can be conveniently tacked on a thin strip of wood of the required length and width, and inserted without removing the holder. A metal shoe can also be used, or one of wood, sawed so as to present the *end grain* to the wheel as a wearing surface, the clamping preventing the splitting of such a shoe, as would otherwise follow, while the sand and gravel, becoming imbedded in the pores of the wood, the friction and wearing quality are much increased.

The entire practicability and great convenience of this invention have been thoroughly demonstrated by its actual use for over a year past in some of the mountainous portions of this State, where a test of its merits would be the most satisfactory. It can be obtained with the shanks fitted, ready to weld to any brake-rod, of Messrs. Waterhouse & Lester, of this city, who are the agents. Any further information can be obtained by addressing them, or the inventor, as above.

Fig. 1.

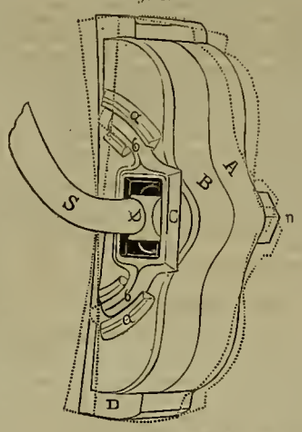
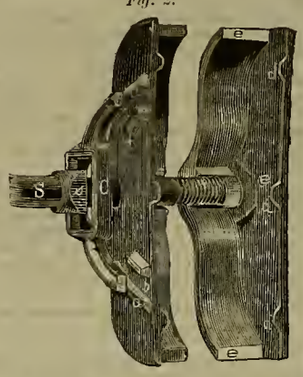


Fig. 2.



THE BIDWELL BRAKE SHOE HOLDER.

The half-yearly report of the Horn Silver mine, Utah, shows it produced $832,754 in silver, and 2,639 tons of lead, worth $347,700, or a total of $1,180,455. This is for six months. The operating expenses were $636,314, and dividends $600,000. In the first six months of the previous year the yield was, in silver and lead, $1,160,000. The Horn Silver M. Co. still continues to ship 15 cars of ore per day from the mines to the smelters. This is equal to about 450 cars a month.

The output of the Old Dominion Copper Company, Arizona, for the month of October was about 550 tons.

Arizona Affairs.—F. A. Tritle, Governor of Arizona, in his annual report to the Secretary of the Interior, after referring to the prosperous condition of the Territory, says: "The unsettled condition of the land grants to the Atlantic and Pacific and Texas Pacific Railroads, before Congress, is preventing, to a great extent, the settlement of the Territory." The Governor says, that unless the extended immigration of Mormons into the Territory is restrained by law, he fears violence. He urges an appropriation for sinking artesian wells in the higher valleys of Arizona, which will render fertile hundreds of thousands of acres. The report also urges a geological survey by the Government, and the establishment of a branch mint.

Fig. 2.

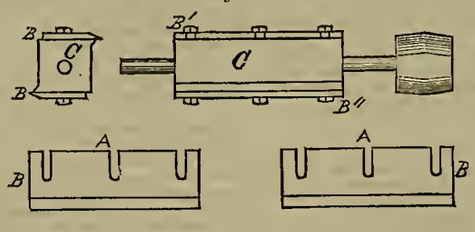
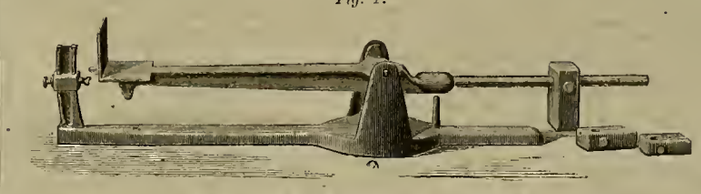


Fig. 1.



SEYMOUR'S PROPORTIONAL SCALE.

The New York *Mining Record* says: The Sierra Buttes Mining Company of California, an English organization, has paid 10 per cent per annum for 14 years upon the par value of the stock, and have a cash reserve in the treasury of $175,000. And yet it is said that mining does not pay.

The entire business portion of the mining town of Silver Plume, Colorado, was burned last week.

Scale for Balancing Cutters and Knives.

The accompanying engravings represent Seymour's proportional scale for balancing moulding knives, planer knives, revolving cutters of whatever shape, knife cap-screws, etc. Fig. 1 shows the scale. To explain the reason for its use, let A A, fig. 2, represent two knives which are to be fastened on to the cutter-head C. Let it be supposed that the knives are of the same specific weight, but that there is an excess of weight at the opposite ends B B; then when revolving on the head, they will cause a violent jarring or "throwing," by reason of the excess at B' and B''. The knives could be reduced to the same specific weight by the aid of common grocers' scales, but that would not attain the object. By the use of the proportional scale, the position, as well as the amount of excess of weight can be ascertained, so that in reducing the knives to the same specific weight they may be made to agree in their corresponding parts. The method hitherto used, is by reducing pairs or sets of knives to the same specific weight; but so great are the differences in the density of the parts of even the same knife, that a still running set of knives is but an accidental result.

The manipulation of the proportional scale is as follows: Let it be supposed that two or more knives are intended to be fastened on to one cutter-head, rotating at a high velocity, and that it be conceded that they must not only be of the same specific weight, but must agree in their corresponding parts. Place each knife in succession on the platform of the scales with its face toward the end-board A, with a suitable weight at the opposite end of the beam. If by this test they all appear to be of the same specific weight, place them each in succession again, with their backs against the end-board A. They may still appear to be of the same specific weight. Place them each in succession flatwise on the platform, in many different positions as of which they are susceptible, noting and reducing by an indefinite number of trials, the edges which are found to be of excessive weight, until they all are reduced to the same weight in their corresponding parts. They will also, then, of course, be of the same specific weight.

The balance weights, BB, are made oblong, so that by putting the heavy end up, the entire mass, consisting of weight beam and knife, may be poised near its center of gravity, and thereby oscillate more sensitively. If, however, the object to be balanced be very heavy, the weight must hang down, or the upper portion of the mass may preponderate. It will be seen that the operator can make the poise more or less delicate, according to the varied positions of the knives to be balanced. This is a very useful appliance for users of planer knives. H. P. Gregory & Co., 2 and 4 California, are Pacific Coast agents.

Copper is abundant in the gold belt, and abounds generally through the Blue Ridge range, Virginia. Mines are worked in Floyd, Carroll and Grayson counties, some of the ores yielding from 26 to 29 per cent of pure copper.

The Canyon Water Mills.—The several little water mills on Six-Mile Canyon have a total of 31 stamps, running steadily and crushing daily about 80 tons of ore, producing about $30,000 worth of bullion per month.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS

Mining in Inyo County.

[From our Special Correspondent.]

This is comparatively a new county, organized as late as 1866. It embraces about 12,000 square miles. Within this area there are vast unexplored fields of both mining and farming ground. In Owens River valley alone there are thousands upon thousands of acres of good grazing and tillable land now open for settlement at government prices. With an abundance of water for irrigation, there is room here for many a happy and thriving home. All it requires is a little energy and capital.

The mineral resources of the county are believed to be both valuable and extensive. With rare exceptions, mining as an industry has been pursued by men but little qualified, from want of means, to prosecute it successfully.

Owing to this and other causes not necessary to name in this connection, this branch of business has for some years somewhat languished. With all the drawbacks, however, millions of bullion have been shipped in the past. The Cerro Gordo alone, in the vicinity of Lone Pine, has yielded not less than $10,000,000, some reports making it $13,000,000. If rumors are true, it is as yet by no means exhausted. At present, considerable prospecting is going on, and a fair amount of bullion is being shipped, as will appear in some details that follow.

Mines near Bishop Creek.

The Polita M. Co. has reached a depth of 360 feet on an incline. The ore varies in width from one inch to nine feet. They employ 16 men, and ship daily to the Hawley mill at Keeler about 15 tons of ore. The first month's run yielded 4 bars of gold bullion, weighing 141 pounds avoirdupois. Translated into terms of coin, it would probably make it something upwards of $30,000. The mine is situated in the Inyo range of the White mountains. It is wholly in limestone, the more noticeable from the fact that the ore is entirely gold-bearing, while silver is usually found in a formation of this kind. Mr. Wm. Irwin, of Bodie, is the superintendent and principal owner.

The Casey Mining Co.

The stock is held chiefly by inhabitants of Paris, Ill., and Terrehaute, Ind., Mr. M. L. Cook, superintendent.

The company own 11 locations within 5 miles of Bishop Creek station, and 2 miles from the track of the C. & C. Railroad. The formation is slate and limestone, and the mines are in the same range of mountains as the Polita Ann, a few miles farther north. They are opened by three shafts and four tunnels, one of 265 feet in length. Thus far they have struck five ledges, all containing free milling gold ore. Assays go from $2 up to $2,000. Rock of the lowest grade gives sample assays from $7 to $20 per ton. The best class, samples as high as $60 per ton. It is looked upon as a fine prospect. If it should pan out as well as it promises, it will gladden the hearts, not only of the stockholders, but that of many a farmer around Bishop creek, who is anxiously hoping for a home market for his surplus produce.

The Brockman Mine,

Although situated just across the line in Mono county, as it is within 15 miles of the station at Bishop creek, may very appropriately receive a notice in this connection. It is the property of Mr. M. Brockman, of this vicinity, and of Dr. S. D. Geore and others, of Alameda.

The surface of the lode has been uncovered to a sufficient depth to show a width of about five feet. The company are running two tunnels to tap the vein, at a depth of 150 feet, meeting stringers in their course, from which a considerable amount of good ore has been saved. It assays from 30 to 60 per cent in copper, and from $100 to $260 per ton silver, some samples giving much higher figures.

About 10 miles east of the station a valuable discovery, or what is believed to be such, was made last spring by Mr. Chas. Morll. It is a five-foot lode in granite, mainly of copper and silver. From some very imperfect tests, it is thought to go from 60 per cent to 70 per cent copper, and at the same time to run very high in silver.

Plumbago in Quantity,

Has been discovered in the Sierra range, near Round valley. As yet the deposit has been but partially explored. The graphite is found in numerous small veins of quartz that promise to develop into a mass of 40 feet in width, according to the best reports, and of a quality rich enough, it is thought, to pay for working. Assays have been made at the Carson mint and it is pronounced the purest yet found on the coast, quantity being taken into consideration. As it is largely used in making our so-called lead pencils and in the manufacture of crucibles, it will prove a valuable discovery if it comes one half way up to the expectations of those most interested. The owners are in correspondence with manufacturers in New York, who are on the outlook for anything that promises well in their line.

The Blue Bell,

Owned by Mr. P. Laird, 15 miles east of Bishop creek, lies near the summit of the mountain. The tunnel strikes the ledge 400 feet from the surface. It is said to be 30 feet wide in a lime formation. It is silver lead ore, requiring a furnace for reduction; assays from $20 to $200. The ore now on the dump is estimated to work from $40 to $50 per ton. It is understood that Mr. Roberts, in the same vicinity, has had ore of a similar character reduced at the Elna furnace that netted him $50 to the ton. It is more properly classed with mines reached from Big Pine.

The mines around Deep Spring valley are represented to be as promising as any in the county, both for future large yields and for permanence, although but a meager account can be here given. W. B. McSweeney has several locations. Among them may be named the Pioneer and the Golden Cave, each from three to four feet wide, containing gold, silver and copper, with assays as high as $75.

The Trade Dollar, owned by Messrs. Payson and Chalmers, is down 100 feet following the vein. The ore nets after shipping to San Francisco, about $33 per ton.

Some mines, worked ten years ago in this district by Mr. J. Broder, and lying idle until lately, are beginning to show a considerable amount of good ore. They are likely to prove valuable, it is thought, on further development.

Over $500 was realized from a shipment of 10 tons from the Index.

The Elna Furnace

Is situated on the line of the Carson and Colorado narrow gauge railroad, seven miles below Big Pine.

After an introduction to Mr. A. P. Minear, general manager of the Montezuma mine and the furnace above named, the following colloquy took place—politics and mingled wit on his part, being omitted—as not altogether suitable for a scientific journal.

"Mr. Minear, will you be kind enough to furnish a few mining items for publication in the MINING AND SCIENTIFIC PRESS?"

"Now, Mr. K., when I came here I really thought I had got out of reach of newspaper men." (Something was said here, half in jest and half earnest, about nuisances, which was not noted down), when Mr. M. turned to catechising: "What benefit will a news item from our mine be to me?"

"If you gain nothing personally, Mr. M., it might render some service and gratification to other miners in the neighborhood, to the farmers in the valley, to the railroad company, that has opened up a once isolated but interesting section, and afford some pleasure and profit to the readers of a widely circulated paper."

"Do you give reliable reports of the mines?"

"That is the intention, but their reliability depends much on the sources from which they are derived."

"Self-interest too often imparts a golden tinge where there is but little of the pure metal."

At this point the conversation was abruptly broken off for more important business, and in the meantime it may be well to state that Mr. M. was found to be something of a wag, and that the seeming reluctance to being interviewed was more apparent than real. The reception afterwards could not have been more cordial and hospitable, so that

The Interview is Renewed

Later under more favorable auspices, and is here given substantially, and almost literally, as it occurred.

"As you seem to have a moment's leisure, Mr. M., will you inform me, if you please, where you obtain the ore for your furnace?"

"From our mine, two miles from here."

"Plenty of it?"

"Any amount."

"What is the grade?"

"It differs very much—runs from $175 per ton and upwards. Last shipment went $300 on an average, some of it higher."

"How wide is your ore body?"

"Can't say. No one knows what is underground. Where we are now working, in an open cut, it seems to be from 20 to 30 feet wide. At greater depth it might dwindle to the size of a piece of chalk, or widen out to chambers as large as an Owen's River barn.'

"Where do you get your flux for furnace?"

"Our lime we get within a mile and a half; our iron in the hills, from five to six miles from the railroad."

"Your fuel?"

"Charcoal we get here, but use mostly coke from San Francisco."

"Is it expensive?"

"Not very. The price of coke and freight is arranged below."

"What is the cost of wood?"

"From $7 to $7.50 per cord. Lumber—from $36 to $40 per thousand feet."

"How many men employed?"

"Guess about 30, all told."

(Beginning to grow weary or witty—which?)

"What do you pay your Chinamen?"

"Coin or currency—whatever comes handy."

"Oh, I mean per day."

"A dollar and a half, and they board themselves."

"How much to white men?"

"Two dollars and board."

"Do you purchase any ore from neighboring mines?"

"Oh, yes, especially if heavy in lead."

"What is the character of the ore bought?"

"Mostly silver-lead, as a rule running from 35 to 60 ounces in silver and from 20 to 50 per cent in lead."

"Does the Railroad Company appear to favor the mining industry of the county?"

"Oh yes, I think so. Mr. H. M. Yerington, general superintendent, and Mr. D. A. Bender, manager of the freight department, both seem to be very clever and accommodating gentlemen."

"In connection with the furnace, you seem to have something like a refinery, Mr. Minear."

"Yes, it is our purpose hereafter to separate the silver from the lead before shipping. Now, Mr. K., is it not about time to let up?"

A word to the wise, you know, is sufficient, so after obtaining full consent to publish the interview in full, your reporter thought it better to run and so "live to fight another day."

Some Mines around Independence.

The old Kearsarge, in the Sierra Nevada rangs, is said to be again taking out some very rich quartz.

A recent strike is reported some 60 miles east of the county seat. It promises to be one of the most valuable discoveries hitherto made in this portion of the State. It is represented as an immense body of copper and silver ore, running high in silver and from 50 to 60 per cent copper.

In Beveridge district several miners are taking out a few tons at a time of very rich rock, anything less than $50 ore—free gold at that—being beneath notice.

The Golden Reef, Freeborn canyon, in the same district, owned by Messrs. Nixon and McDermott, has a tunnel which follows the lode 200 feet into the mountain. It is a 2-foot fissure vein in granite of gold-bearing rock. It works $40 per ton at their 5-stamp mill.

Some Mines at Darwin.

Mr. J. C. Eddy is said to have cleaned up not a great while ago $9,000, after a run of 14 days. Some of the ore is worth $300 per ton.

The Defiance property, of Mr. P. Reddy, of your city, is at present being worked with a small force. A winze sunk on the second ledge in the south, worked to the depth of 105 feet, has passed through a continuous and well-defined body of galena ore mixed with fluor-spar. A drift from the bottom of the winze is now being driven through the same character of rock to determine the extent of this valuable ore body. Assays run about 70 ounces silver and 75 per cent in lead. So much for the mines of Inyo. It is very evident that there is a wide field still unexplored.

A. C. K.

Independence, Inyo Co.

Copper Strike at Bisbee.

EDITORS PRESS:—I am pleased to inform you of a big strike of copper in the Atlanta, adjoining the Copper Queen, and to whom much credit is due for the able manner in which the affairs of this mine have been carried out.

The Atlanta is owned by the well-known firm of Phelps, Dodge & Co., N. Y., and under the directorship of Prof. Jas. Douglas, Jr., of the same city. For a long time this company seemed to undergo many difficulties, in the shape of adverse claimants and blackmailings on every side, which threatened to engulf this property in endless litigation. But since the beginning of work on this property, great success has been achieved under the head of one of our most practical miners, Mr. John Prout (for many years known in Idaho, Nevada, Califoruia, and more recently in Tombstone, Arizona). He has at last revealed the hid en treasure. Backed by such capitalists he has met with the success so richly deserved. This discovery was made in a two compartment vertical shaft 300 feet in depth. In this depth they have pierced into 120 feet of copper, assaying up to 30 per cent, with the present bottom in the same ore body, with every possibility of its continuation. No walls have been seen in either direction since entering the deposit. Operations are carried on as fast as the present machinery will admit, but which will soon be replaced by more powerful for the more rapid development. I hope soon to chronicle the Atlanta among the most prominent of copper producers.

STEV. FREDERICK.

From the Blind Miner.

EDITORS PRESS:—I have been measuring up my tunnels, and find I am within about 150 feet of my upper tunnel. Now the Alta channel is about 60 feet wide, and the deposit comes right around like a fish-hook, doubling the width of it at that point and forming a bedrock dam right across the channel, and my lower tunnel is right in the dam driving right into the center of the bow. My upper tunnel, as it were, is driven right across the point of the hook, and the distance up and down can be hardly less than the diameter, which is about 125 feet. This will not leave more than 25 feet further to drive before I tap my gravel, but it is going to be a hard job for me to get through at that, and I need help. You scientific men will not think half as much of your wisdom, when you find you have allowed your caution to run away with your good sense and deprived yourselves of the opportunity of opening up one of the widest and most profitable fields of usefulness that ever presented itself, and a chance to make your science of more practical use than it will ever be possible to do without it. As soon as I can strike my pay gravel, I will not have the slightest interest in turning over this great benefit to men that would see me and my family starve before they would say or do the least thing to help me, no matter what I offer. I say such generosity could hardly be expected when it would be decidedly to my disadvantage, so I will keep my secret and the scientific men can keep their dollars. The prophets all around me have given me as hard a road to travel as possible, and if they have accidentally told the truth they did not know it, but they are careful never to face me; and, with all my efforts, I never have had a tunnel driven yet in my own mine or anybody else's where I told them that they would find the pay. I have never had a dollar to pay a man, so I could tell him he should go where I wanted him to, and now my partner's ideas are played out, and he is got to go where I tell him or nowhere, and the latest prophet's dodge is to tell my young partner that I will not give him the share I promised him when I strike the pay. The meanness of a would-be prophet has no stopping place. What I have discovered needed no further proving, for there was more than enough already. I only needed to start the industry as newly understood, but I have been met everywhere with a sneer, and told that I must make my discoveries known and convince others before I can have any help, but I guess they will have to wait some time. If I can't be trusted, I have learned better than to trust them.

H. CLENDENEN.

New Processes.

Professor Comstock, in the Silverton (Colo.) *Democrat*, thus criticises several new process plants in a manner that will not elevate him in the eyes of their promoters, and yet it is impossible to say that the Professor has cut inside his scoring line, although his chips are very large and dangerous to the optics of "local editors."

There are three candidates for public favor within a radius of 100 miles of Silverton, each of which claim to be on the verge of a wonderful achievement, no less than the revolution of the whole business of smelting by treating ores at nominal rates. Experiments of this kind must always be interesting to miners and metallurgists, but there is one principle, which, if acted upon, will do much good by saving heavy losses and untold regrets. There is a class of thoroughly trained professional metallurgists in this country, and it is well known that they are constantly seeking to prove and cheapen the processes of reduction by all means in their power. It is quite safe to trust them to discover the practical merits of all new processes, and much needless expenditure would be saved if their opinions, after careful tests, should be taken as a guide in place of the invariably favorable reports of local editors, whose knowledge of metallurgy is absolutely *nil*.

The new Moffett smelter at Gunnison, according to mere newspaper reports, is a wonderful success. Now, as a matter of fact, there seems to have been no examination by a metallurgist of known competence, and any person of this class would be compelled to condemn the process after reading what is said of it even by its wildest advocates. We state just what its friends say when we report that one-half of the lead is lost in the roasting, and the slag is such as to necessitate the loss of much more lead and silver in the after process. It is very significant that the local papers announce an unheard of success in the very sentences which convey the information that "bullion is running freely, etc.," but that no tests of ore and slag have yet been made.

The Pasadena smelter at Rico is another "new process smelter." We can gain no notion whatever of its features from the local papers, but, of course, in their estimation, it is a "complete success." Perhaps it is, but if so, its projection will hasten to have it most rigidly scrutinized by the most accomplished metallurgist that can be secured for that purpose, and when they report favorably giving such details as their professional brethren can appreciate, it will be time enough to erect others of the kind.

The Duryea smelter, at Animas City, has also been announced as successful, although its trial run has not yet been made. The basis for this report is the supposed success of a decided metallurgical failure of the process at Canyon city. The furnace of this pattern at that point was examined by a newspaper reporter, supplemented by some tests by an assayer of undoubted ability, but no metallurgical report was made. F. B. Hine assayed the ore and slag and reported that little or no metal was left in the slag. But, unfortunately, the amount of metal produced was not reported and the necessity of several miles of dust chambers to condemn the wasted furnaces was admitted. That the Duryea will smelt silver ores is not questioned, and it may be able to do so very cheaply, as a custom works charging by the ton, but it will probably result in heavy losses by volatilization of metal. If this view be erroneous, the company which represents the process have not yet offered any proof to the contrary.

AN agreement has been entered into with the Holmes Company, which owns the two mills at Belleville, recently belonging to the Northern Belle, whereby Mt. Diablo ore will be milled at a cost of $12.75 per ton. As soon as one of the mills can be put in repair, crushing will begin. There is already a large accumulation of ore. The Mt. Diablo Company will have about $22,000 in the treasury, after paying last month's expenses.

MECHANICAL PROGRESS.

Vapors Evolved by Heating Metals.

The following is an extract from a paper presented by Mr. John Parry, of Ebbw Vale, at the Chester meeting of the British Iron and Steel Institute: Metallurgists favored with opportunities of observing the behavior of metals while being heated or fused, are of opinion that the fumes usually seen are due to the volatilization of the metal itself, or of some more volatile constituent. In casting alloys of the more fusible metals, this dissolution or volatilization is an accepted fact, and is usually considered when adjusting the proportion of the constituents. Alloys of the more infusible metals, such as iron, manganese, nickel, cobalt, etc., have not been studied, but those who have observed the behavior of crude iron and steel while being fused, or otherwise manipulated at high temperatures, have noted, that in addition to the well-known evolution of gas, fumes are given off, which has led to the inference that, as before stated, some more volatile constituent is being evolved; and Professor Ledebur asserts that even iron is volatilized.

The chemical composition of a metal may therefore be changed, presumably, within certain narrow limits. It may be that crude iron is slowly dissociated, and certainly at the high temperature of the Bessemer process, iron is volatilized, and may be seen far above the mouth of the convertor, forming a red cloud, quite unlike ordinary smoke or vapor. The spectroscopic examination of the flames issuing from blast and other furnaces shows only continuous spectra, with but few lines, very similar to the spectrum of the ordinary Bunsen flame, with the exception of the Bessemer flame, which gives the carbon spectrum, together with (according to some observers) that of manganese. I have, however, found that many of the metals are volatilized at a comparatively low temperature, but give only continuous spectra when examined in the flame. The vapor requires the intense heat of the electric spark to be passed through it, to insure complete dissociation and consequent production of the usual line spectra.

Spiegeleisen fused in a crucible evolved a fume in which I detected zinc, copper, manganese, calcium, and, with less certainty, magnesium. Bessemer pig iron, similarly treated, gave copper, manganese, calcium and either lead or arsenic, as well as gas burning with a flame resembling that of carbonic oxide. Bessemer pig iron burnt in a stream of oxygen at a dull red heat gave copper, manganese, etc., as before, but more intensely; also a great number of lines which appear to be derived from iron. This spectrum requires careful study, and, when developed, may throw some light on the reactions occuring during the Bessemer blow. Spanish iron ore reduced in a crucible with charcoal, at a heat sufficient to form a button of fused metal, evolved zinc, copper and manganese.

It is therefore probable that matter may be evolved during the ordinary heating processes in the manufacture of iron and steel, as previously explained, but giving no visible indications of the fact, in consequence of the heat being sufficient only to volatilize without effecting dissociation. With my present limited experience, I am of opinion that the actual quantity of matter evolved from iron, steel, etc., is very small, and not at all likely to affect the quality of the coarser kinds of iron and steel, although it may be otherwise when a material of even quality and great purity is required.

The germ of the foregoing is to be found in the recent work of spectroscopists, more especially of Mr. Lockyer, who, in his "Studies in Spectrum Analysis"—a volume abounding with suggestions which should, in my opinion, be carefully studied by those practically engaged in the iron manufactures—says: "Depend upon it, that as spectroscopy becomes the daily work of iron-founders and the like, it will be found to be bristling with scientific truth which may be used in these practical applications."

The Fusion of Iron.

In the *Metallarbeiter*, says a foreign exchange, there recently appeared some observations on the behavior of iron in smelting and casting. It was pointed out that the metallurgical processes by which iron is extracted from the ore, produces at the first running a metal which is chiefly iron, but which also contains carbon, silicon, manganese and other substances. These are impurities, but they have their uses in lowering the melting point of the metal. Pure iron, from its very high fusing point, is not well adapted for foundry use. The pig iron, with its high percentage of carbon, is much more convenient for castings. When pig iron is remelted in a cupola, air is brought into contact with the metal, and the carbon mixed in it. Part of the carbon is oxidized, and the other impurities, such as silicon and manganese, together with a small quantity of iron, are oxidized and drawn off as slag. Other products of oxidation—carbonic oxide and iron oxide—are dissolved in the molten metal. The aqueous vapor of the air employed in the cupola blast is decomposed into oxygen and hydrogen, the first of which goes to oxidize the fuel and metal, the latter is dissolved in the metal. Iron possesses the property of absorbing, in the molten state, three times its volume of hydrogen. As the metal cools, the occluded gases (hydrogen and carbonic oxide) are set free, leaving traces of their presence in their spongy, porous surface frequently found in solidified masses of metal. When molten iron containing these gases is run into a mold, the gases are liberated in the casting. This is especially the case where the metal is run at a low temperature. The gases are best eliminated by making the iron very hot, and stirring it well in the ladles before filling the molds. Iron, when remelted, has a greatly increased power of absorbing gases and iron oxide. For homogeneous castings it is necessary that all pig-iron should be used, without admixture of old castings. Spongy castings are also caused by an improper molding material, which leads to the formation of surface cavities. The bubbles produced by dissolved gases, however, have a bright, metallic surface, while those due to the molds are covered with a dull film of oxide.

WORKING HARD IRON.—In a little jobbing machine shop the proprietor and sole workman was sweating over the obduracy of a lot of very thin castings, which he was trying to drill for riveting, and to file for fitting. Some of the castings were very hard, and ground out and broke drills at a fearful rate. Where the grindstone or the emery wheel could reach, they were used instead of the file. Many of the pieces were rejected because of their hardness, and it was thought necessary to make them of iron, to be made malleable at a greatly enhanced cost. A visitor suggested the use of spirits of turpentine on drill and file. After some demur it was tried, and the work proceeded. The speed of the drill was somewhat reduced from that of a drill in soft gray iron, but the obdurate material yielded to the persuasive influence of the turpentine. The file was kept wet with it, and there was no difficulty in cutting the hard metal. It is ascertained, however, that the supply of turpentine must be continuous—a common mucilage brush is handy for the purpose—and that the turpentine, evaporated and oxidized by exposure until it is somewhat viscid, is better than the limpid spirit, as having more body.

MANGANESE STEEL.—The new manganese steel, the invention of Mr. Robert Hadfield, of Sheffield, England, for which patents have been secured both in this country and England, is attracting considerable attention, both here and abroad. M. Gautier, of the Terre Noir Works in France, has become the representative of Mr. Hadfield in France. The more recent experiments of Mr. Hadfield's demonstrate that he was justified in all the claims he made for the steel. The castings are free from the honeycomb, the welding capacity of the steel is greater, it has greater tenacity when hot, and can be used as castings for many purposes for which now forgo steel is demanded. We also learn that some very interesting and important experiments have been or are about to be made with this steel in connection with shells, armor-plates and guns.

A MASTER KEY.—Mr. Walton, lockmaker, Great Russell street, Birmingham, is about to exhibit at the Wolverhampton Exhibition, a master key which he claims is capable of opening 22,600 patent lever locks, all the locks to be different—that is to say, each of the 22,600 locks may be different in their wards or combinations. The key weighs three ounces, and is nickel-plated. It has taken Mr. Walton, the inventor, three years to complete the drawings of the different wards and combinations which enable this extraordinary product of human ingenuity to be made. Master keys capable of opening 100 different combinations have been known to the trade for many years, but nothing approaching the key in question has ever been accomplished before.

LEATHER FACED PULLEYS.—A competent and experienced millwright, gives, as the result of his experience of 38 years, that iron pulleys should be faced with leather, particularly if the belt is not to be shipped, as from fast to loose pulley. His plan is to cut the leather of the proper width, slightly wider than the pulley face, soak it soft in water, and then apply it to the pulley by stretching, using copper rivets to secure the butt joint and an occasional rivet on the edge. The leather is put on flesh side outward. Next to the leather face he prefers a built-up wooden pulley, the segments of wood to be secured in an iron frame, with the ends of the grain outward. Such pulley faces, he claims to be greatly superior to polished iron or to wood, with the grain horizontal.

IMPROVEMENT IN CASTING RAILROAD WHEELS.—At the open-hearth steel works of the Cambria Iron Company the experiment is now being made of casting steel tires for locomotive and car wheels by running the metal directly from the furnaces into cast iron molds, and ready, when cooled, to be fitted and shrunk on. This process, if successful, will dispense with the ordinary process of casting in sand molds, and will not only greatly facilitate operations but also lessen the expense.

TO HARDEN CAST-IRON.—Use 1 pint oil vitriol, 1 bushel salt, 1 pound saltpeter, 2 pounds alum, ¼ pound cyanate of potash, 20 gallons water. Heat to a cherry red, and dip as usual. If more than an ordinary degree of hardness is required, heat and dip a second time.

SCIENTIFIC PROGRESS.

A Distilling Insect.

Livingstone met with a wonderful distilling insect in Africa on lig trees. Seven or eight of the insects cluster round a spot on one of the smaller branches of a tree or shrub, and keep up a constant distillation of a clear fluid like water, which, dropping to the ground, forms a little puddle. If a vessel is placed under them in the evening, it will collect two or three pints of fluid by morning. To the question, "Whence is this fluid derived?" the natives reply that the insects suck it out of the tree, and many naturalists have given the same answer. But Livingstone never could find any wound in the bark, or any proof whatever that the insect pierced it.

Our common frog hopper, before it gets its wings is called "cuckoo-spit," and lives on many plants in a frothy, spittle-like fluid, like that of the African insect. Livingstone considers that the African insect derives much of its fluid by absorbing it from the air. He found some of the insects on a castor-oil plant, and he cut away about 20 inches of the bark between the insects and the tree, and destroyed all the vegetable tissue which carried the sap from the tree to the place where the insects were distilling. The distillation was then going on at the rate of one drop in every 67 seconds, or about 5½ tablespoonfuls every 24 hours. Next morning, although the supplies of sap were stopped, supposing them to come up from the ground, the fluid was increased to one drop every 5 secouds, or one pint in every 24 hours. He then cut the branch so much that it broke, but they still went on at the rate of a drop every 5 seconds, while another colony of the insects on a branch of the same tree gave a drop every 17 seconds.

Importance of Trifles in Science.

Few circumstances in the history of scientific progress are more remarkable than the way in which apparently insignificant facts suddenly acquire an unexpected importance. A physicist examines with interest a few dark lines which he detects in the solar spectrum, and by degrees the peculiarity attracts attention among scientific inquirers; yet the very laborers in the new field of research would have heard with amazement that the lines they were examining were one day to become the means of teaching us how to analyze the central luminary of our system.

Again, inquisitive men examined the phenomena of electricity, and accumulated a number of seemingly unimportant facts; yet the days were to come when results which appeared to be mere matters of curiosity were to bear more largely on the interests of men and nations than any, perhaps, which have ever rewarded the inquiries of scientific men.

The steam-engine itself, which alone vies with the electric telegraph in the importance of its influence on the well-being of mankind, resulted from inquiries suggested by the insignificant movements of a common saucepan-lid.

In the history of astronomy we are presented with many illustrations of the kind here referred to.

RAPID PROGRESS IN ELECTRIC SCIENCE.—The Philadelphia *Ledger* makes the following note of progress in the application of electricity: "Only 12 years ago Prof. Tyndall gave his course of memorable lectures in horticultural hall. He had with him as a part of his apparatus an arc light. The lamp was regulated by clockwork, and cost probably ten times as much as the lamps made to-day. It was imperfect in every way, the light being very unsteady, and several times got out of order at critical moments. The current was supplied from a voltaic battery, at a cost that precluded its use for any but lecturing purposes. The battery, besides being costly and troublesome, required the constant work of an attendant for a day or two to 'set up,' and it was also was very apt to get out of order. Dynamo machines were not unknown at that time, but they were too costly, and for lecturing purposes the battery was considered best. Looking at the display of lamps in the exhibition, and the great variety and number of dynamo machines, it seems almost incredible that it is only 12 years since such a man as Prof. Tyndall was well pleased, rather than otherwise, to be able to exhibit his poorly regulated clockwork lamp, run by some hundreds of cells in a voltaic battery."

STEEL AND BRONZE must have been known to the early lake dwellers of Switzerland, as many specimens of such work have been found, within a few years, among the remains of that singular people. The gem of these unique collections is a steel sword found at Corcelettes. The fact that it is steel has been proved by an analysis, and the specimen is unique among Lacrustine finds. The blade, which has suffered somewhat by fire, is 25.58 inches long, straight and pointed, and the waved lines with which it is embellished are evidently the work of some prehistoric engraver. Who were the forgers of this weapon is a question which Dr. Goss discusses at some length, and, having regard to the undoubted skill of the Lacustrians as metal-workers, and to other circumstances, he leans decidedly to the opinion that it was wrought by themselves; yet, seeing that no other arm of the same material has been found elsewhere, the correctness of this conclusion is perhaps open to doubt. Among other objects brought to light by the labors of Dr. Goss, are bronze daggers, highly ornamented hatchets, chisels, gouges, knives, hammers, anvils, needles, tools for net-making, fishing tackle, buttons, chains, spoons, spear-heads, arrow-points and rings, bracelets, and other ornaments in great variety. Strange to say, saws, though they seemed to have abounded in the stone age, are rarely found among the vestiges of the age of bronze. The total finds of them in the Swiss lakes do not exceed half a dozen, of which two are in the collection of Dr. Goss. One was found at Moerigen, the other at Auvernier, and both appear to have been used as frame saws.

THE NOVEMBER METEORS.—About the time the present issue reaches our subscribers, the earth, in her orbit, will have encountered the November meteor zone and will be plunging along in her course through that remarkable train of minute cosmical bodies, which consists of countless numbers of such bodies following in a long train a highly eccentric orbit around the sun, in very much the same way as the group of "asteroids," which have always belonged to our solar system, follow in their orbit, scattered over immense distances in their path. The asteroids are supposed to have been originally a planetary formation, which became disrupted either in the act of being thrown off from the sun or from some convulsion, which occured at some after period in their remote history. The November zone is supposed to have been derived from the disintegration of a cometary body—Tempel's comet. This unfortunate visitor from the star depths venturing too near the planet Uranus, was captured by the giant orb, forced to become a member of the system, and to travel henceforth within its boundaries. The event probably occurred in the second century of the Christian Era. The perihelion of the November meteor zone is on the earth's orbit, at the point she passes about the 13th of November, and the aphelion is beyond the orbit of Uranus. The particles of the comet and the swarm of meteoroids have thus far scattered over but one tenth of the zone, but in the course of time will fill the whole space. As the period of revolution is about 33 years, a grand display of fiery rain occurs only at those intervals. The next one may be expected in 1899.

A NEW TELEPHONE.—A new telephone is in market, which is operated without electricity. The secret lies in the diaphragm, which is made of an imported wood; layers of it woven together are screwed to the mouth piece, and the telephone is complete. The wire used is made of phosphor-bronze, but ordinary steel wire can be used. The diaphragm is so sensitive that it can reproduce vocal vibrations distinctly, even at a distance of two miles. Aspirates and sounds that it is impossible to transmit over any known telephone are easily reproduced by this telephone. When the operator blew his breath on the diaphragm, the listener at the other end detected at once what had been done.

ELECTRIC INSECTS.—Some of the savants are investigating electric insects. General Davis of the British army, who was a famous insect collector, once picked up a "wheelbug" in the West Indies and received a shock which paralyzed his arm. On shaking the insect off, he noticed six red marks on his skin—the impression of its feet. This particular bug is now being studied closely. Some of the luminous beetles are found to be very electric and one investigator, upon taking up an unknown caterpillar in India, received such a shock that his entire left side was paralyzed and he remained for a long time dangerously ill.

THE STONE AGE IN CHINA.—Searching the history of China for evidences of a stone age, Mr. Joseph Edkins finds that as far back as B. C. 2205, in the time of Yu, all the common metals are mentioned in a list of tribute offered the Emperor. Fifty years before, the Emperor Shun had buried gold to make the people less covetous. A stone hatchet has lately been found near Kalgan, in a mound 40 feet high. The mound, and others in its neighborhood, are said to resemble those of Ohio, and the hatchet is not to be distinguished from those of the "mound builders" in Ohio museums.

HEAD OF THE MISSISSIPPI.—Lake Glazier, discovered in July, 1881, by Captain William Glazier, is now declared to be the veritable head of the Mississippi river. It lies above and beyond Lake Itasca, and its waters have an elevation of probably three feet above that lake, being connected therewith with a swift, small stream. Lake Glazier is about a mile and a half in length by a mile in breadth.

SNAKE POISON.—Sir Joseph Fayer considers it most remarkable that a poisonous snake cannot poison one of its species, and only slightly any venomous snake, although it quickly kills harmless snakes. A vigorous cobra can kill several dogs, or from a dozen to twenty fowls, before its bite becomes impotent, and then the rapid re-secretion of virus soon makes it as dangerous as ever.

KIRCHER, NOT PASTEUR.—It is now claimed that Kircher originated the germ theory of infectuous diseases 200 years ago, and not Pasteur, as it is supposed, in modern days.

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MINING SUMMARY—From the various counties of California, Nevada, Arizona, Idaho, Montana, New Mexico, Oregon and Utah, 312.

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Business Announcements.

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Passing Events.

Political matters have absorbed the attention of the people to the exclusion of business affairs for some time, and the excitement has not abated as early as was expected. But by next week a fresh impetus will be given to business, it is hoped, as it has been dull for some months.

The Oregon R. R. and Navigation Co.'s Baker City branch has been joined with the Oregon Short line, thus completing another line across the continent. Trains will begin running next month.

Mining news of special moment is scarce. Little attention has been paid to the mining industry of late. We hear of few strikes and few sales. The ordinary work, however, is being pursued in the various camps. One of our most prosperous mining sections in this State is now San Bernardino county, where several camps are doing well. The Calico mines have yielded this year, $734,836. The Sierra *Tribune* states that the miners in the northern part of that county have joined to put a debris dam in Slate creek. They have also built a strong dam below the old one on the same stream.

REMARKABLE COPPER RUN.—The Old Dominion Copper Company reported a product of 550 tons of fine copper bullion for the past month from two of the Rankin & Brayton 30-ton copper smelters, which is a return of over 18,000 pounds per day for each smelter. It is safe to say that no such result has ever before been obtained by any other system of smelting in any part of the world. Such a run is of course exceptional, yet it shows what can be done with these furnaces under favorable conditions. Nothing but such improved methods for handling these ores saves this interest in the present depressed condition of the copper market.

Discouraging Mining.

The population of California has been very largely increased during the past year, and several hundred immigrants are coming in every week still, with no present prospect of the supply giving out. Yet none of these people are coming here to do any mining, although we have plenty of mining area to be developed. Of late years, however, the policy of the laws and the people seems to have been to discourage mining operations on every hand. Old Californians can scarcely realize this fact, which is nevertheless true. The State has produced, since gold was first found here, over $1,200,000,000, and still, even under adverse circumstances, yields from $15,000,000 to $20,000,000 annually. It is estimated that $900,000,000 came from our placers and hydraulic mines. The first are exhausted and the latter are prevented from being worked by the decision of the Courts. It seems strange that an industry which has yielded so much solid and lasting wealth, and which still continues to produce, should not be encouraged. Since the closing down of the mines hard times have existed all over the State. Thousands have been thrown out of employment and money is very scarce.

It is but just to say, however, that it is only the gold mines which have lessened their yield. We produce in this State a good many other things from mines. Quicksilver, coal, iron, sulphur, salt, borax, silver, antimony, plumbago, and many other substances are mined profitably. But on the whole, mining as an industry is rather frowned down. And this in a State that is world-renowned for its mineral wealth. Capital has been turned in other directions by this discouragement, and sent to other regions where mining is more recognized.

It is as well for all our citizens to consider these things, and reflect if it would not be better to encourage all legitimate mining operations by word and deed. The money from a mine is not a mere exchange, like a good deal of our "business," but the yield is so much added to the world's wealth. It is substantial and will stay with us. Outside of mining circles it is very difficult to find persons who will invest or even look for an investment in this industry. Yet this should not be so. Experience has proven mining to be a legitimate business, and one in which much wealth is to be attained when properly conducted. There are hundreds of mines now known, and hundreds yet to be found, which will yield rich returns. But as long as the present policy of discouragement prevails, the bullion yield of California will continue to be comparatively small.

Homestead and Mineral Claimants.

The Secretary of the Interior has considered the motion for review of a previous decision in the case of Silas Tuhbs, mineral claimant, vs. John C. Dillian, homestead claimant involving lands in the Sacramento Land District, in this State. The motion was made on the ground that one Crafts was the principal witness for Dillian, and that he testified in the trial that the land was not valuable for minerals, when, according to Tuhbs, he knew that it was. Tuhbs also says that he lived 50 miles from the place of trial, and that he was taken by surprise at the testimony of the homestead claimant, and had not witnesses on the ground to rebut it and to challenge the truth of their statements.

The issue to be tried, and which was tried, was the character of the land—whether agricultural or mineral. Tuhbs had notice of the issue, and the Secretary says if he neglected to have witnesses on the ground to rebut the other man's proofs, he cannot be relieved from his neglect in not fully preparing for the trial. He filed affidavits to show that Craft's reputation for veracity was bad; but the other side filed many more affidavits testifying to the contrary. The Secretary decides: "The fact that the claimant could not obtain witnesses in time to rebut opposing statements, is not sufficient ground for rehearing when the issue to be tried is as to the character of the land." It behooves miners in such cases to look out and have their witnesses ready to prove the mineral character of the land.

ABOUT 500 tons of ingot copper of a high grade are produced annually, and 1,200 to 1,500 tons of copper ore shipped from the mines of North Carolina.

New Ore Concentrator.

Mr. George H. Malter, of this city, has patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, a new apparatus for concentrating ores or tailings. Settling tubs are so placed that the first shall discharge into the second, the second into the third, and so on. These tubs also increase in size as they progress. Preferably they are made with vertical, cylindrical sides and deep, conical bottoms, but may be of different forms, with outlet pipes at the bottom, which have their discharge ends swiveled, so as to be turned up and down at will, and with valves to control the discharge. From a point at some hight above each tub or vessel, a tubular shaft extends nearly to the bottom of the vessel at its center, and its lower end is guided by a spider or arm, which extends from it to the sides of the conical bottom. This tube receives water from the main pipe at such a hight above the vessel, that the pressure causes a current to flow out into the pan from its lower end. This water enters the vessel near the bottom of the cone, and rises up through the pulp, which is discharged into the vessel by means of a sluice at the top and on one side.

The tubular shaft has arms fixed to it at a point just below the level of the top of the pan, and vertical arms or stirrers extend downward from these arms to points near the bottom of the vessel. As the bottom is conical, it will be seen that these arms increase in length from the circumference toward the center, in order to bring their ends near the sides of the cone and produce a suitable agitation of the contents. The shaft and arms are rotated by bevel gear.

At a point just below the level of the top of the tub, a receiver or box is supported at or near the center of said tub, so that the lighter tailings carried up by the water may flow over the sides into it, and be carried from it out through a sluice or pipe.

The operation is as follows: Pulp being admitted through the sluice, falls down toward the bottom of the vessel, where it meets a current of water flowing upward from the bottom of the cone, where it enters through the hollow shaft. The arms being set in motion, will stir and agitate the mass, throwing the heavier particles outward, where they fall upon the inclined conical bottom and slide downward to the discharge pipe, through which they are allowed to pass out as desired. The lighter tailings are carried upward by the current of water, and flow over into the central box or receiver, from which they pass out through the pipe at the top of the vessel; and if a series of tubs are used, they fall in the next one below, to pass through a similar operation therein. The concentrated material is drawn off at the bottom through the pipe placed there for the purpose.

Lead Smelting.

Charcoal of good quality will smelt more charges in the same time and under the same circumstances than coke, but coke will make cleaner slags and less flue dust than charcoal. A mixture of charcoal and coke will be more advantageous economically in many localities, than either alone. The size of the blower and the quantity of air it supplies should be adequate to the size of the furnace, else it cannot reach its highest effect. In using blast of a low pressure less material will pass through the furnace than with one of higher pressure; but it is advisable to work with a moderate blast, so as to allow the smelting mixture sufficient time for complete reduction. Hard ores require a blast of higher pressure than easily fusible ones. The formation of flue dust can also be regulated by the pressure of the blast aside from the fuel.

The best size of material for smelting is considered by an authority on the subject to be that of a goose egg; iron and limestone flux, however, may reach the size of a man's fist, while quartz should be broken much smaller. Such material smelts very rapidly. Pulverulent ores give much trouble by sifting through the fuel and arriving before the tuyeres in a raw state, where they will cake together and form a sow, or enter the slag and cause a loss of metal. Very fine ores, such as slimes from concentrating works, especially if they are rich in silver, should be agglutinated with milk of lime previous to putting them into the furnace; otherwise a very large proportion will be blown out of the furnace as flue dust. If roasting precedes smelting, it will be found judicious to bind the wasted ore also with lime. If the slag should show undue qualities of precious metals, this would indicate the necessity of such a method.

The fusibility of an ore is greatly enhanced if it contains much lead and little silica, alumina, and above all, no zinc compounds. A large percentage of oxide or silicate of zinc in an ore, even if properly fluxed, is liable to reduce the smelting-capacity of a furnace to one-half of what it would be if running on more favorable ores. In truth a lead blast furnace has no fixed smelting capacity in tons of material. If we do rate its capacity we should express it, in tons of smelting mixture or charge, and not of ore.

Car Couplers.

The great danger in the use of the couplings in general use on freight cars and the number of accidents which have occurred all over the United States, has, by the use of the common link and pin coupling, for years kept the attention of railway companies directed to the necessity of a coupling that while it shall combine simplicity with ease of manipulation, will also remove the danger, at least to a great extent, now incurred in coupling cars when it becomes necessary for the brakeman to go between the cars for this purpose. This important question has come up before the Master Car Builders' Association, and committees have been heretofore appointed to examine into the question and to report to that Association at its annual meeting, upon such couplers as they considered most suitable for adoption. It may be imagined the magnitude of their task when it is known that nearly 4,000 patents have been taken out in the United States alone for improvements in couplers. It seems, however, that this committee reduced their labors in a great degree by confining their particular examination and report upon such couplers as had to some extent been used on railways, and had already had a trial of such length and under such circumstances as would warrant an intelligent opinion being formed of their merits and demerits. From the experience of the members seven conditions were enumerated, which it was considered necessary the couplers should fulfill in order that they could be recommended. These were as follows:

1. Couple on a vertical plane, so as to allow for varying hights of draw heads.
2. Dispense with loose link and pin.
3. Couple with ordinary link and pin coupler.
4. Cheap in first cost and repairs.
5. A valid patent, passed by Eastern and Western railway associations.
6. Mechanically efficient.
7. Safe.

The committee recommended eight couplers as worthy of special mention, consisting of the Archer, Cowell, United States, Janney, Ames, Mitchell, Wilson & Walker and Conway-Ball. About one dozen were recommended as "meritorious." To those inventors who may be interested in the construction of couplers and the forms of those which have been endorsed by the committee of the Master Car Builders' Association, we would say that they are illustrated in the *Railroad Gazette*, of September 26th, 1884, with description of each coupling illustrated. We know there are many inventors in California and on the Pacific Coast who have had experience in railroading, and here is now an opportunity for them to exercise their inventive faculties.

Thanksgiving.

Thanksgiving again approaches. Let all prepare to enjoy and profit by the day. The President has issued the following proclamation:

The season is nigh when it is the yearly wont of this people to observe a day appointed for this purpose by the President, as an especial occasion for thanksgiving unto God. Now, therefore, in recognition of this hallowed custom, I, Chester A. Arthur, President of the United States, do hereby designate as such day of general thanksgiving, Thursday, the 27th of this present November, and I do recommend that throughout the land, the people, ceasing from their accustomed occupations, do then keep a holiday at their several homes, and their several places of worship, and with heart and voice pay reverent acknowledgment to the Giver of all good, for the countless blessings wherewith he has visited the nation.

CHESTER A. ARTHUR.

Attest: THEODORE FRELINGHUYSEN,
Secretary of State.

Park City, Utah.

A Lively Mining Settlement, Within a Region of Great Promise.

[From our Special Correspondent.]

Park City is the leading mining camp or settlement in the Territory of Utah. It is the focus of several extensive mining districts, technically defined, which radiate from it in different directions along the mountain spurs or divides of this mineral-bearing portion of the Wahsatch mountains. In a direct line it is a little less than 30 miles southeast of Salt Lake City. It can be reached by rail from that city, but the trip necessitates traversing the three sides of an imaginary parallelogram, as the passenger must first go to Ogden, on the Union Pacific; then to Echo, 30 miles or more east; and then, via the Echo and Park City Railroad (a branch of the Union Pacific) to his destination. The trip consumes five to six hours. There is also a stage route between the two cities, which makes the trip during good weather in about the same time. The line is managed by the Kimball Brothers, sons of a pioneer stage man of Utah. On a pleasant day the ride over the plain from Salt Lake to the foot of the mountains, thence up a narrow canyon to "The Park"—a mountain-walled plateau, near the town to which it has given a name—thence up another canyon to Park City, is as enjoyable a trip as one can easily make in Utah. We found all the circumstances pleasant upon our late passage over the route. The fare by stage between the two places is $2.50; by rail it is $3.50, if one buys a through ticket; if not, it is $5.30, or more. Before leaving Salt Lake City the stage stops at all the principal hotels, thus making it a convenient as well as cheap means of passage between the two cities. Park City is hardly a "city" in point of population. It may contain 2,000 people. But there are few drones here. Nearly all are engaged in work about the mines of the locality, or are busy in matters of trade. There are a few mills and other pieces of mining property in a quiescent state, but there are good prospects that in the near future these will again be started into activity. We found the town not much given to braggadocio, or idle talk, but a sturdy settlement of busy, reliant people.

The Ontario Mine and Mill.

The Ontario Company own one of the most lucrative pieces of mining property in the United States. Its output is exceeded by that of the Horn Silver, also in Utah—of which we have already given a sketch—but we think few other concerns can show a better balance sheet than the Ontario. The mine is located a mile or more from Park City, up a steep canyon. Three distinct shafts descend to the working parts of the mine, the last one sunk being named No. 3. Here are the newest machines, and the finest and the largest. This shaft is upon the opposite side of the canyon from No. 1 and No. 2, and up to the present time has been used largely for hoisting waste, lowering timbers, etc., leaving No. 2 free to hoist the ore which supplies the mill. No. 1 is the original shaft of the company, and will be likely to be abandoned as the mine continues to be worked out toward No. 3. There is an extensive machine shop and a blacksmith shop between No. 1 and No. 2. At each of these shafts the hoists are not extensive, but at No. 3 can be seen machines that will elicit praise from any lover of mechanics. The immense Cornish pump works with great smoothness and apparent ease. At present it is not heavily taxed. Most of the water in the mine is encountered below the 600-foot level, and 900 feet is the lowest depth at which work is prosecuted. At the 600-foot station a tunnel enters the mine, so that the lift for the pump is not so great, and it raises very easily the large stream of water that flows from the mouth of the tunnel, a mile below the mine. The pump room is kept with the neatness of a parlor, and the trimness of the apartment is enhanced by the brilliancy and polish of the silently-working, complicated parts of the large machine. The hoisting works in the adjoining room are also well kept and beautiful, and are constructed upon the latest models and plans. M. G. Foote, the Chief-Engineer of the Ontario, is a veteran in his line, and knows all about mining machinery. He superintended the erection of the hoisting machinery at the Anaconda mine, Butte City, another plant of remarkable size and excellence. The Ontario mine employs from 350 to 375 men. Sixty to seventy-five tons of ore per day are taken out, all of which, with the exception of 150 tons per month, goes to the mill below. The 150 tons spoken of are a high-grade smelting ore, which is shipped to smelters at Salt Lake or elsewhere. The milling ore is carried by ore wagons to the mill. The mine is kept well opened out, and as lower levels are reached there is no apparent diminution in the value or extent of the ore bodies. As before stated, 900 feet is the lowest working level.

The mill, in the upper outskirts of town, employs about 100 men. It contains 50 stamps, 24 amalgamating pans, 12 settlers, and the necessary roasting furnaces for a chlorizing plant of the capacity above indicated. There are machine, blacksmith and carpenter shops, assay office, etc., attached to the mill. The engine which runs the stamps, pans, etc., is of 260 horse-power, built by Prescott, Scott & Co. It is kept very steadily at work, night and day, and as yet no fault in this machine has necessitated a stoppage of the works. At the time of our visit the mill was running to only one-half its capacity, as repairs were being made in some of the furnaces. We have obtained from R. C. Chambers, Esq., the superintendent of the company, at Salt Lake, a statement of the product in bullion from the Ontario mine and mill during the nine months preceding October 1, 1884. The average monthly product was $161,242, which would bring the yearly sales of bullion up to very nearly $2,000,000. There are none but complimentary words as to the management of the Ontario, both in Salt Lake and Park City, and surely a casual visitor could see nothing to condemn, were he so inclined. J. B. Haggin, of San Francisco, the principal owner of the mammoth mining properties of Montana, is similarly interested in the Ontario.

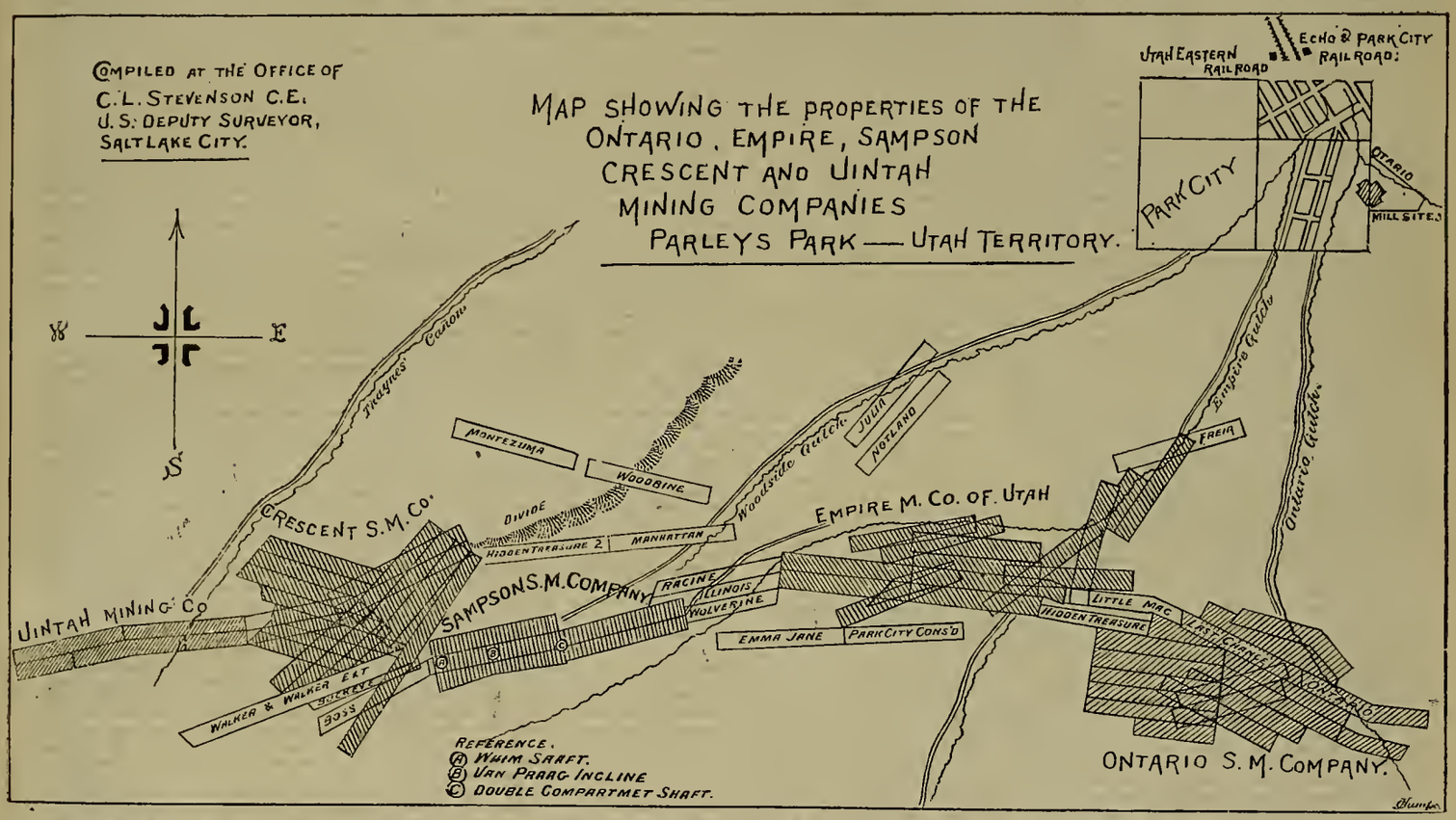
At the Ontario we met Mr. E. H. Russell, who has for several years past been the metallurgist of that company. As may be known to many of the readers of the PRESS, he has discovered and patented a process of extracting valuable metals from ore by a new lixiviation or leeching process. He has had erected an experimental plant at the Ontario mill, where he has continued his researches from time to time, and demonstrated that his plan is feasible and practicable. He has lately been engaged by W. S. Godbe and others, to take charge of an institution at Bullionville, Nevada, where the Raymond & Ely tailings will be treated by the Russell process, upon an extensive scale. We are promised a description of the workings of this place and elsewhere within the next two or three months, from the pen of a thoroughly competent person, and we are assured the matter will be eagerly read by all workers in metals who have access to our paper. These tailings carry 12 ounces in silver and $2.40 in gold to the ton, and it is presumed that by this new process they can be worked with great success.

The Crescent.

Next to the Ontario, the most extensive property at Park City is that of the Crescent. The mining property includes several conjoined locations, lying on the opposite sides of a high hill, some three or four miles from town and two miles west of the Ontario mine. Ore is taken from tunnels which penetrate the hill at various places. The most extensive of these tunnels is the Bullion, though the Etna, just below it, and three tunnels on the opposite side of the hill, are, or can be made, ore producers, as each taps the ledge. These tunnels are producing 100 to 125 tons per day, which can be taken to the concentrator in town or to the railway station, by means of a tramway along the sides of the hills, five miles in length. It is heavy down-grade to the concentrator, and the cars run themselves, needing only to be controlled by brakes. Mules are employed to haul the cars back. The Bullion tunnel runs 700 feet into the hill; the tunnel below, 1,600 feet. No water is encountered, except for a short time in the spring, after the melting of winter snows. A considerable force of men is employed in these tunnels. Their boarding-house has a Swiss-like outlook, as the canyon below is deep, and the inclination of the hill very steep. Mr. S. Stephenson is superintendent of mining operation, Mr. Matthews foreman. From the former we learned that there is an accumulation of at least 40,000 tons of good concentrating ore on the dumps at the mine, which, after the completion of the concentrator in town, can be handled with profit.

The Crescent Company is now erecting concentrating works adjacent to the smelter in the lower portion of Park City. We believe the management of smelter and concentrator are technically in different hands; but hereafter the works will be virtually joined, as the smelter will run on ore and concentrates from the Crescent mine. The concentrator was designed by D. D. Vanduzen, Esq., of Salt Lake City, and the various parts of the machinery were mostly manufactured there. The main portions of the plant are: A rock-breaker, for primary crushing; Cornish rolls, for finer work of this nature; six revolving screens; four three-compartment jigs; three McKim's concentrating tables, for slimes; with complete parts for small sampling works on the floor below the machinery above mentioned. Col. W. M. Ferry has had charge of the construction of the works, though Mr. Vanduzen was on the ground at the time of our visit, which was but a few days prior to the proposed starting of the machinery. A comparatively small force of men will be able to run this concentrator, as the work will be almost entirely automatic. One hundred to 125 tons per day will easily be handled. C. H. Whithey will superintend the smelter, which has for some time past been idle. The Crescent property is under the able general superintendence of E. P. Ferry, Esq., President of the company. He is also President of the Marsac Mining and Milling Co., which owns a fine 20-stamp chloridizing mill at Park City. This property was idle at the time of our visit, though it is more than probable that the productive district in which the mill is located will

(*Concluded on page 317.*)



Mining Assessments in November.

The demands of mine owners this mouth are again moderate. This appears to he, says the *Bulletin*, the most sensihle thing about the industry at present. It is known that many of the mines in operation arc doing very poorly, and have heen for a long time. It is wise on the part of the owners not to press their money calls too extravagantly or too frequently. Hundreds havc already become discouraged, if not disgusted, with the miserahle returns for the outlays of the past few years. In order to preserve the present clientage, it will he necessary to be exceedingly moderate in these money drafts on depleted purses and hank accounts, and to economize at every possible point. There is undoubtedly much more room for economy in the consolidation of interests, if in no other direction, and something of this kind may he doue.

The assessments to become delinquent in November are as follows:

	Per Share.	Amount	Del. Sept.
Alaska Mill	$0 70	$1,400	15
Butte Creek Hydraulic	10	1,000	8
Day	75	75,000	3
Golden Fleece Gravel	40 00	4,000	18
Gould & Curry	50	54,000	29
Peerless	25	25,000	3
Sierra Nevada	50	50,000	26
Utah	50	10,000	28

The Alaska mine is on Douglass Island, Alaska, and this is the eighth assessment, the previous one becoming delinquent in August. The reports of the mineral resources of Alaska have heen generally good, hut there are many obstacles in the way of a successful prosecution of mining work in that direction. The Butte Creek Hydraulic minc is in Butte county, and there have heen ten assessments, the previous one hecoming delinquent in July. Butte county is supposed to he a good mining district, though it has not contrihuted much to the hullion supply. The Day mine is in Lincoln county, Nevada. It has at times looked quite promising, and many have thought it would become a leading hullion producer. Considerable metal-hearing ore has heen taken out. The expenses, however, have been large, and the miue is now considerahly in dcht. The previous assessment became delinquent last January, and this is the fifteenth. It is not known how much stock has heen forfeited.

The Golden Fleece Gravel claim is in Placer county, a hopeful district, and one that has contrihuted more or less hullion. This is the 34th assessment, the previous onc becoming delinquent in Septcmber. The levies have always heen at the rate of $30, $40 or $50 per share, and the charitable presumption is that there are but few shares in the company. The Gould & Curry has levied 49 assessments, the previous one becoming delinquent last July. The stockholders arc still hopeful that some of the lines of development of this old Storey county mine will yet justify the ontlay that has been made in the last decade. The Pcerless is in the new Quijotoa district, Pima county, Arizona. The first assessment became delinquent last May. The district is one of the most promising that has been discovered in the past three years. Mr. Mackey has just returned from that section, and has expressed himself as satisfied witb the progress mado and the outlook.

The Sierra Nevada is an octogenarian in the assessment business, the present one being the number 80. The previous one hecamc delinquent last June. The amount is reduced to one-half of former levies, owing to the discouragemcnts in the market. The Sierra Nevada company has a large property. At one time it was thought it would develop into a largor bonanza than either California or Consolidated Virginia. This was some six years or more ago. It will he remembered that under tbe influence of some discoveries in that mine, in the latter part of 1877, or the fore part of 1878, the stock was advanced from 90 cents in May, 1877, to $290 in Septemher, 1878. In other words, the nominal market value of the mine was raised from $90,000 to $29,000,000 in 16 months. Since thon the stock has gone hack to 90 cents per share. Thc Utah has levied 51 assessments, the previous one falling delinquent in Septemher. There are only 20,000 shares in Utah, and the levies have always heen faithfully met.

The assessment moncy to hecome delinquent this month will be apportioned as follows, if collcctcd:

Nevada—		
Storey county	$114,000	
Lincoln	76,000	$180,000
California—		
Butte county	1,000	
Placer	4,000	5,000
Alaska—		
Douglas Island	1,400	1,400
Arizona—		
Pima county	25,000	25,000
Totals	$220,400	$220,400

During the corresponding month last year, 12 assessments hecamc delinquent, aggregating $271,000, of which $231,000 was claimed by Nevada, including $178,000 for Storey county, $20,000 hy California, and $20,000 by Utah.

YES, my son, there is gold in the mountains of Idaho and Montana. Lots of it. And so there is heaps of it in the United States Treasury, too. And it is just ahout as easy to get it from one place as the other. Good deal easier, in fact.—*Burdette.*

A Successful Small Mill

A correspondent of tbe Candelaria *True Fissure* writing from Garfield District, speaks as follows of the new Farrington mill, which the editor speaks of as the most economical working quartz mill in Nevada:—Your correspondent baving been invited to he in attendence on the ocassion of the starting up of Farrington Brothers' mill, he, in company with the popular Archio Farrington, proceeded to the mill twelve miles distant from Soda Springs, where we found a little town, without name, all belonging to the proprietors oi the mill, of whom I will hereafter speak more fully. The mill has five stamps. The ore is hrought hy teams from the different mines of the eompany. It is weighed and dumped into thc ore-house, where the proper percentage of salt is added. The coarse ore is passed into a Blake orc hreaker, running at a speed of 200 revolutions a minute. The fine ore goes into a chute connecting with the one from the hreaker, and through which it gravitates and discharges into a cylindrical drying furnace (a section of a cone), which revolves upon its axis, at a speed of three and one-half revolutious per minute, and having sufficient inclination to gravitate the ore into the self feeder. From thence under the stamps, which drop 95 times a miuute. The ore is then conveyed mechanically to the elevator, which carries it into a large hopper, from which it continuously discharges into the Thompson's improved rotary roasting furnace, revolving upon its axis four and a half times a minute. Chloridization in this furnace is most perfect heing up to 96 and 98 per cent, of the assay value. The discharge from the furnace is continuous into a chamher, from whence it is drawn into iron cars and allowed to cool. There heing a large number of those cars, they are filled and stored on a spare track of T iron until cool. Then they are run into the pan room and are discharged into the pans from their sides.

pans are of the most approved pattern, and perfect grinders, revolving at a speed of seventy-two revolutions per minute, where the most perfect amalgamation takes place, up to as high as nine-four per cent of the assay value of the ore. After which the pulp is discharged into the huge settlers, revolving at a speed of eighteen revolutions a minute, and having an abundance of pure, clear water to insure the most perfect settling of tbe quicksilver and amalgam. After this the quicksilver and amalgam is drawn into the cleaning pan, and from there into the conical strainer. The tailings are allowed to run from the settlers into the reservoir for future generations to experiment with. The amalgam is taken from the strainer and placed in a cylindrical retort, tbe capacity of which is 600 pounds at a charge.

The bullion, on being removed from tho retort, is conveyed to the assay office, which is at a proper distance from the mill, where it is melted into hars and their value ascertained by the assay, when they are ready for shipment. The machinery of tbe mill is driven by steam power. The whole structure is suhstantially built, is neat, compact and convenient, reducing fifteen tons of ore a day, witb the aid of four men, including an engineer, or eight men in twenty-fours. It heing a dry crusher, it might he said that neccssarily it must be dirty and dusty, but this is not the case. When the ore once passes into the breaker, or the fine ore chute, it is not again seen or handled hy human band until it is discharged red hot from the roaster. Therefore, the mill is free from dust. At present the whole amount of wood consumed is a little less than five cords per day, at a cost of four and a half dollars per cord, delivered at the mill. At a suitable distance from the mill is a hlacksmith shop, provided with all tbe modern tools and appliances so necessary ahout an establishment of the kind. A little further away is tbe assay office and melting room, which is a model. It is provided with the very hest scales, all manner of tools and appliances necessary, and convenient for the perfect determination of the value of the ores and hullion. In fact, this is the most complete and best appointed reduction works in this State. The proprietors deserve great credit and success in the enterprise on whicb they have emharked. The mill was designed and built hy E. A. Morton, who has had more than twenty years' experience in mill building, and for thc most of that time has huilt and kept in repair dry crushing mills. His first experience was with the Ophir company's mill at Ophir, then at Dalls' mill at Franktown, then the U. S. Grant mill, in California, and for a number of years at the once famous Northern Belle mills at Belleville. As a mechanic he has no superior, his head being as long proportionately as he himself is. The proprietors have a comfortable hoarding house and lodging bouse, as well as a store well stocked with all kinds of miners' goods, which are sold at reasonable prices. They also have several neat, cosy and comfortable dwelling houses especially for the convenience of their employes who have families. They are situated in connection with mill huildings, making quite a town, and for its name I would suggest "Farrington." It can be seen that they and their master mechanic had in view as neat, compact clean and durable, lahor and *silver* saving mill, and they have it.

Riparian Rights.

A short time ago the Supreme Court rendered a decision in favor of riparian rights and against the appropriation of water for irrigation purposes except as to lands owned entirely hy the State or the United States, and that a purchase from the State oi lands hordering on a water-course, makes the purchaser riparian proprietor against all suhsequent appropriation. This decision was reached in the case commenced in 1879 hy Miller & Lux, in Kern county, against J. B. Haggin to restrain him from diverting the waters at Kern river from eertain lands claimed hy Miller & Lux, and for which they hold a United States patent, dated 1876. Haggin claims the right to use the waters of the stream hy virtue of an appropriation made in 1875. At the trial Miller & Lux offered in evidence certificates of purchase from the State, of a date prior to the act of appropriation hy Haggin. The Court rejected the evidence thus offerced. The Supreme Court holds that such evidence is material, and the key to the whole situation, and should have heen admitted. The order of the lower Court, which gave such wide satisfaction to those engaged in our great irrigation enterprises, is therefore reversed, and the case will now come up merely upon the fact whether the plaintiffs were indeed owners previous to the appropriation of the water, and if they were, they are hy the doctrine of riparian rights, entitled to restrain the plaintiff from taking out the water for irrigation purposes.

This decision will give great dissatisfaction in our irrigated districts, and it is fortunate that the Supreme Court did not commit itself to this unfortunate doctrine hy any great unanimity of action. The fact is that of the seven judges sitting *in banc*, four were in favor of the maintenance of the old riparian rights' doctrine and three dissented. The plaintiff won, therefore, hy a single vote.

There is no comfort nor satisfaction in reading the opinion of the majority of the Courts in this case. It is merely the reaffirmation of the law, which was enacted, or, at least, was engrafted, into common law in countries where conditions prevail, which are wholly at variance with those which exist in this State, as has been often shown. It does not fit our ideas of the development of the country, to declare that, in order to give one man water for his stock at some point down the stream, a whole valley above must remain a desert. The dissenting opinions are far more in harmony with our climatic conditions, and with the genius of advancement of the State. For example, Judge Ross, in his dissenting opinion, bas this excellent paragraph:

Although numerous contests with respect to water have arisen and been adjudicated hy the Supreme Court of this State, as well as by the Supreme Court of tbe United States, neither court has heretofore heen called upon to decide the precise question now at issue. But the principle which, in my opinion, should control its determinatiou, bas been uniformly held by both trihunals. The doctrine that the water of a stream must continue to flow in its natural course undiminished in quantity, has heen so far modified in States with the climatic conditions of Massachusetts and Illinois, as to permit the diversion of water for the purposes of irrigation, where the quantity of the stream is necessarily diminished, by at least the quantity absorhed in the irrigation of the land upon which it is put. Especially should this be so in California, where, in a great part of the State, water is very life-hlood. Every practical man must know that, with tbe dry atmosphere and porous soils of those sections requiring irrigation, but little, if any, of the water diverted and used in irrigation is or can he returned to the stream from whicb it is taken. To establish, therefore, as the law of this State, that the water of a waterconse must flow on in its natural channel undiminished in quantity, would in effect he to convert the fertile fields, gardens, orchards, and vineyards in many and great sections of the State into waste and desert places. Such a rule is inapplicable to the condition of things existing here. The common law is supposed, and has been said to be the perfection of human reason, but it would be the very reverse of this to hold that the waters of the streams of California must continue to flow in their natural channels until they sink into the sand or waste themselves in the sea, while orchards, vineyards and growing crops, of immense, if not incalculahle value, perish for thirst.

This is certainly good sense, and if it is not good law, the coming legislature should make it so hy statute. We may give farther extracts from the several opinions on this subject hereafter as space may allow.—*Rural Press.*

OLD GROUND PROSPECTED.—A good deal of prospecting is still going on over about Washoe lake, and in the section of country hetwcen the lake and Mount Davidson. All the mining in that region is at or near the surface. No deep shafts have been sunk, and no machinery has ever been set up. Thus far all the hoisting has been done hy means of an ordinary windlass. Nothing is done on such veins as do not show pay on the surfaco.

The Concentrating Mill at Stockton, Utah.

A correspondent of the Salt Lake *Tribune* says: But there are substantial reasons for helieving that Stockton is soon to see hetter days. Some of these reasons may he found in the mining outlook as it was seen hy your correspondent. The concentrating mill, owned and operated hy the Honorine Mining Company, under the superintendence of C. E. Mitchener, is probably the most perfect of the kind in the West. The old Great Basin smelter has been remodeled and converted into a concentrator, so as to do most excellent work. The machinery consists of one of the largest Blake crushers, one set of Crom's steel rolls, one small set of Dodge rolls, six revolving sizing screens, eight three-compartment jigs, one hydraulic classifier, and two slime tahles. This machinery is operated by a seventy-five horse power engine. Eight men are sufficient to concentrate thirty-two tons of ore in ten hours, producing eight tons of ore averaging sixty-five per cent ead and thirty ounces of silver. To do this requires about one and a one-half cords of wood, at a cost of about $3 75 per cord. Seven grades of ore are turned out hy this mill, and then all is mixed together, producing the average we have named. It may be of interest to mining men to know that the slimes are worked over by passing over vihrating tahles, hy which six per cent of the entire product is saved from the slimes. These tahles were designed by Mr. Michener. The company has a four-inch pipe five miles long to convey their supply of water to the mill from Solnier canyon. The mill is operated on ore from the mines helonging to the company, composed of Cleveland and Boston men. The mill turns out 200 tons of fine ore per month, while the mines add another hundred tons of first-class ore, going sixty-five per cent lead and thirty-six ounces silver. The mines are the Honorine, Great Basin and First National. The Great Basin in years past, was a large producer of ore, the history of which has heen familiar to the readers of the *Tribune*. The ore lies in chimneys, with barren spots on the vein, hetween these ore chutes. The vein runs through the Great Basin, Honorine and First National, in all of which work is progressing, twenty-five men being employed. The ore hodies are very large, and the property has a splendid outlook. A strike has just heen made on the 600-foot level in the Honorine, tapping solid galena eight feet, running 73 per cent lead and 37 ounces silver. Drifts are being run on the levels to tap this ore chimney. The eompany have all the concentrating or that they can reduce with their mill, and they have in contemplation the erection of another mill to work custom ores. Should they do this, it will add much to the camp and give new life to it, as there are many good prospects having concentrating ores which cannot be worked with the present facilities.

THE LEASING SYSTEM.—In speaking of the leasing system, at present in vogue at Georgetown, a correspondent of the Kingston *Clipper* says: "The returns only average wages or less. Ore that milled 1,500 ounces to the ton a few months past, now only gives 60 ounces, and not over 80 ounces." The incousistency of this can he better appreciated when we state that this same correspondent, in a previous letter, informed the half-dozen subscribers of the *Clipper* that the "leasing system was giving good returns, and that the leasers are satisfied." The truth of the matter is, a majority of the leasers are making more money than they could at any other employment. Of course there has been some dissatisfaction expressed. We have never yet seen a mining camp where there were 250 or 300 men employed, where there was not dissatisfaction of some kind—usually the boarding-house bash, or the quality of the mountain dew comes in for the kick—but in this case there is no reason for such complaint, as both are reported first-class, and the superintendent of the mine is the next person to whom the chronic pessimist owes his compliments, and he proceeds as above. The lessees make from $50 to $1,300 per month, as can be shown from the books of the company, after paying their one-fourth royalty.

The local furniture manufacturing industry is dull, for dealers are overstocked with cheap Eastern goods. Our manufacturers are satisfied that the time is near at hand when the demand for superior home-made furniture will equal the capacity of the present factories. The country trade is quite dull, but the manufacturers account for the loss of trade with Oregon and Washington Territory by the competition which exists through the establishment of a number of new furniture factories in Portland, which, in addition to our coast industries, is found to detract from San Francisco trade. Formerly nearly one-half of the furniture made here was sent to Oregon and the north, and to the south.

THE Bonanza King mine, in the Providence mountains, with a ten-stamp mill, is turning out $750,000 annually; keeps 100 men at work at good wages, and supports, directly or indirectly, over 500 persons.

The Orange Tree and Its Fruit.

The culture of the orange is becoming one of the important horticultural industries of the State. Its climatic adaptation has a much colder range than is generally supposed. It is grown in its highest perfection throughout nearly all the southern portion of the State, and it is also produced in favorable locations, as far north as the upper extremity of the valley of the Sacramento river. Next, perhaps, to the olive, the orange tree is the longest lived fruit tree known. It is reputed to have attained the age of 300 years, and it has been known to have flourished and borne fruit for more than 100 years. But few fruit trees will grow and produce fruit so well under rough treatment. It commences to bear the third or fourth year after budding, and by the fifth year it will produce quite a crop, but its yield will increase gradually under favorable circumstances, and as years pass on it will become a very productive tree. The early growth of the orange is comparatively rapid, and by the 10th year it will have increased more than in the next 50 years, so far as its breadth and hight are concerned; but its age multiplies its fruit stems greatly, and an old tree will sometimes bear several thousand oranges.

There are many oranges of curious shape and flavor, which we seldom or never see in this country. Such are the pear-shaped kind grown in the far East; the orange of the Phillipines, which is no larger than a good-sized cherry, the double orange, in which two perfect oranges appear, one within the other, and the "fingered citron" of China, which is very large, and is placed on the table by the Celestials, rather for its exquisite fragrance than for eating.

The Origin of the Orange.

A Florida exchange gives the following abstract of a lecture delivered in that State by Prof. Gunning: "Everything," the speaker said, "writes its history," and his task was to read the history recorded in an orange. "What is an orange? and how came it to be?" Dissecting an apple, an orange, and a grape, the structure of each was pointed out. The ten little dots seen in the cross-section of an apple show that the fruit sustains certain relations to the flower. In a longitudinal section we can trace that relationship. We see that the portion of the fruit outside of the dots was formed by a thickening of the calyx or cup. The fruit between the dots and the core, was formed by a coalescing and thickening of the base of the corolla and stamens. The core is the extended base of the pistil. Every part of the flower has been wrought into the fruit. In the grape, neither flower-cup, nor corolla, nor stamens have been wrought into fruit. The pulp holding the seeds is the thickened pericarp. This plan makes a berry. The orange is after the plan of the grape and not of the apple.

The Orange is a Berry,

And it differs from other berries internally in in the longitudinal segmentation. What does this segmentation mean? The orange is one of the most variable of fruits. When it grows on a rich soil it sports into many varieties. The "navel" is a monstrosity fixed as a variety. A navel is two oranges, one being aborted. All organisms, plant or animal, are liable to revert or slip back into an earlier condition. When you see corn, with silk and tassel all together, you know what it means. It is a lapse into the wild state. Now if you were to see an orange split at the bloom end into a number of pod-like segments, what would you say is the meaning? It would not do to dismiss it from the mind as 'a freak of nature.' Such oranges are not uncommon. The internal segmentation cuts through the rind and affects the whole upper portion of the orange. The rind passes in between the segments. This is a tendency to what science would call the 'apocarpous' condition. It is the earliest and lowest form of fructification known to the botanist. It is shown in that primitive style of flower, the buttercup. The pistil, the inmost portion of the flower, represents a leaf folded in and united on the edges. In the buttercup a whirl of leaves have formed pistils, each pistil being distinct, and, when ripe, pod-like. The orange which separates at the bloom end into pod-like segments is a lapse toward the structure of the buttercup. The separation is on the plane of the normal segments. We must infer that the segmentation which characterizes the rind-covered berry called the orange is the vestige of our ancestor which bore its fruit in pod-like clusters. The orange was bean-like before it came to be a berry. In the course of time the pods coalesced and passed into pulp, all but a vestige of which remains as a thin membrane.

LABOR AND COAL.—"Coal lays in ledges under the ground until labor, with pick and windlass, brings it to the surface. We may well call it black diamonds. Every basket is power and civilization. For coal is a portable climate. It carries the heat of the tropics to Labrador and the polar circle; and it is the means of transporting itself whithersoever it is wanted. Watt and Stephenson whispered in the ears of mankind their secret, that *a few ounces of coal will draw two tons a mile*; and coal carries coal, by rail and by boat, to make Canada as warm as Calcutta, and with its comfort brings its industrial power."

USEFUL INFORMATION.

Preservation of Coal from Crumbling.

An article in the September number of Van Nostrand's Magazine, on the "Alteration of Mineral Coal by Exposure to the Atmosphere," concludes as follows:

Freshly-mined coal, deposited on the rubbish piles is capable of condensing several times its volume of oxygen in its pores. The oxygen absorbed, enters into chemical combination with the easily oxidized constituents. According as the absorption is rapid or slow, a greater or less elevation of temperature is produced. In the former it may lead to spontaneous combustion. The crumbling of coal is, among other causes, a consequence of the absorption and condensation of oxygen in its pores, and the chemical changes taking place. The escape of the hygroscopic moisture favors the absorption of oxygen. The pyrites can only produce a furthersome effect on the increase of temperature when present in considerable quantities, and then only in presence of moisture and air; in the dry state they must be regarded as perfectly passive, and may even be detrimental to the warming. Freshly-mined coal placed in an atmosphere of steam can suffer no change. Even with incomplete exclusion of the air the steam will, in general, oppose oxidation and warming, principally by uniform moistening of the pieces of coal.

BUILDING 100 FREIGHT CARS IN NINE HOURS.—This altogether unparalleled feat was performed in the freight car shops of Pullman's Palace Car Company, at Pullman, Illinois, on August 18th. The cars were flats, and formed part of an order for the Vicksburg, Shreveport & Pacific Railway Company, which desired to have them delivered as soon as possible. The task was accomplished without any special extra preparation. The work was "laid out" as usual on Saturday, that is, five sets of wheels and axles were placed on each of the seven tracks used in the work, and the materials for each of the cars were placed along the tracks in the usual manner. When the whistle sounded at 7 A. M. the men sprang to their work. Of the 29 gangs, 28 consisted of four men each, but the best gang was one hand short, because of sickness. The three men preferred to do the work themselves rather than take on a fourth hand. The first completed car was turned at 9:15 A. M., and the first lot of twelve completed cars was pulled out of the shop at 10:40 A. M. The hearty interest felt by all the men in this splendid contest was shown by the cheers which rang along the lines when this first finished lot began to move out of the shop. The writer reached the scene at about 4 P. M. and found the floors being laid on the last two or three of the 100 cars. It is within bounds to say that the whole number was finished by 5 P. M., and by 6 P. M. 24 of them were lettered and ready to ship. The remaining 76 were lettered and shipped during the next day.—*Railway Age.*

TO MEASURE THE HIGHT OF A TREE.—There is a very simple way of measuring the hight of a tree which can be practiced by any one on a sunny day or in bright moonlight. All the apparatus that is necessary is a straight stick of any length. Draw a circle with a radius (half the diameter) of a little less than the length of the stick. This will be done by holding one end of the stick, say two inches from its end, and moving the other end around, making the circle with a knife or a chip. Then place the stick in the ground exactly in the center of the circle, perfectly upright, and press it down until the hight of the stick is exactly the same as the radius of the circle. When the end of the shadow of the stick exactly touches the circle, then also the shadow of the tree will be exactly in length the same measurement as its hight. Of course, in such a case, the sun will be at an exact angle of 45°. Measurements of this character can be best effected in the summer, when the sun is powerful, and has reached to a good hight in the heavens, and when the trees are clothed with living green so as to cast a dense shadow. To many to whom this idea may not have occurred, it might be made annually a matter of interest thus on warm summer days to take the hight of prominent trees, and so to compare growth from year to year.

NEW PROCESS FOR PRESERVING MEAT.—Mr. Richard Jones, who has for many years devoted his attention to the preservation of meat, has now adopted a new process. The principle consists in the injection of a fluid preparation of boracic acid into the blood of the animal, immediately after it has been stunned, and before its heart has ceased to beat; the whole operation, including the removal of the blood and chemical fluid from the body of the animal only taking a few minutes. The quantity of boracic acid used is very small, and that little is almost immediately drawn out again with the blood. The preservation of the flesh is said to be thoroughly effected; the quantity of the chemical left in the flesh must therefore be very small, and can scarcely be injurious to the human system; for, as Professor Barff has proved by experiment, living animals, either of the human or other species, do not seem to be injured in any way by the consumption of it. A demonstration of the effects of the process was given in April at the Adelphi Hotel, London, when the joints cut from a sheep that had been hanging for more than seven weeks at the house of the Society of Arts, were cooked in various ways, and those present agreed that the meat was equal to ordinary butcher's meat.

CHUCKING WAX.—Sometimes the machinist, as well as the jeweler, requires a means of fastening thin work to the lathe chuck, or to a plate for vise manipulation that will not admit of the use of screws, bolts or similar means. A number of recipes are extant in the shops for the preparation of a wax for this purpose, but most of them are troublesome to mix and annoying in use. Probably as good a fastener as any is melted gum lac—shellac. All the preparation necessary is to melt the lac in a pan or other receptacle, over a slow fire, and while it is still warm shape it into sticks like those of sealing wax or candy, for convenience in use. To be used, the piece to be secured to the chuck should be warmed over a spirit lamp or gas flame, a little of the lac put on in spots, and while warm attached to the face plate and trued by light taps with a mallet. Or the lac alone may be warmed and put on the work. The work may be detached from the face plate or chuck by gentle heating, or if this is inexpedient, by light taps with a wooden mallet.

LIGHTING UP THE TRAIN.—One of the uses to which it is proposed to put the locomotive electric headlight, we are informed by the president of a railroad, is to have a second illuminator placed on the rear of the engineer's cab, throwing a flood of light over the train, and so arranged that it can be turned to the right or left and so made to illuminate the station grounds when the train is at a standstill. This will be a grand improvement, which the traveling public will thoroughly appreciate.

TO MAKE TIGHT STEAM JOINTS, ETC.—Take white lead ground in oil, incorporate as much manganese (black oxide) as possible, adding a small portion of litharge. Knead it with the hand, dusting the board with red lead. The mass is made into a small roll, and laid on the plate, first oiling the plate with linseed oil. It then can be screwed and pressed into position.

NOT UP TO THE AMERICANS.—Mexican railways are severely annoyed in some places by a set of petty "wreckers" who steal spikes, ties, car-couplers, etc. The country has not yet risen to be the equal of her sister Republic. When she can produce men who can steal an entire railway, then she may boast equality.

PERPETUAL MOTION.—Over $50,000,000 is said to have been spent in attempts to solve the problem of perpetual motion.

GOOD HEALTH.

Remedy for Quinsy.

J. M. H. gives us her personal experience in trying different remedies for "quinsy," all of which proved miserable and annoying failures, until a lady friend recommended the following:

First, three doses aconite at intervals of 30 minutes, to be followed by lachesis at the same interval until the patient is somewhat relieved; then at longer intervals, giving the aconite only as symptoms of fever may appear. Keep warm, avoid draughts, and occasionally gargle the throat with warm water; also keep a warm flannel pinned around the neck until the throat is well. Belladonna is also an excellent remedy in place of lachesis, but I have always succeeded with the lachesis.

Bryonia relieves the soreness when suppuration has already commenced, and is is too late to "break up" an attack.

CURE FOR SCIATICA.—A remedial agency not commonly resorted to, has been recently brought under notice by M. Dehove for the relief of neuralgic sciatica. This physician seems to have met with considerable success in the treatment of sciatica by freezing the skin. Richardson's ether spray not proving satisfactory, M. Dehove employed the chloride of methyl, which may give rise to a degree of cold represented by 23° C. This agent has the advantage of not being expensive. A jet of the fluid is made to play on the skin along the whole length of the limb, corresponding to the course of the sciatic nerve and its main branches. The good effects are said to be instantaneous. The operation is also claimed to be but little painful; the smarting is not so great as that caused by the hot iron. Vesication has followed the employment of this remedy, but never any sloughing. The extension of this measure to other neuralgiæ is advocated.—*Lancet.*

HOW TO TREAT SPRAINS.—A prominent physician, Dr. Thos. L. Shearer, says that the following modes of treatment for spraius have proven very efficacious: Take clay, such as is used for making bricks, free from gravel, dried, and finely powdered in a mortar. This powdered clay is mixed with water into a thick and moist consistence. This is then spread on muslin to the depth of a quarter of an inch, and applied entirely around the part. Over this is placed a rubber roller bandage, just lightly enough to keep the dressing from shifting, and retain the moisture. This application should be renewed every 24 hours. It appears, by this method of treatment, the most severe sprains are cured much more rapidly and satisfactorily than by the old system. The same authority states that powdered dried earth sprinkled on the surface of an ulcer, and kept in position by adhesive straps, is a capital dressing for cases which are so weak that even the weakest ointment tends to break down the granulations. Prof. Brinton, another celebrated practitioner, says that the best thing for a sprain is to put the limb into a vessel of very hot water immediately, then add boiling water as it can be borne. Keep the part immersed for 20 minutes, or until the pain subsides; then apply a tight bandage, and order rest. Sometimes the joint can be used in 12 hours. If necessary, use a silicate of sodium dressing.

DEAF MUTES.—A statistician estimates that the numbers of deaf mutes in the world are roughly calculated to be from 700,000 to 900,000, and of these, 63 per cent are said to be born deaf, the others losing their hearing by different accidents. The numbers of deaf mutes in Great Britain amount probably to about 20,000. To meet the educational wants of these there are on the face of the globe 397 institutions, containing 26,473 inmates of both sexes, and employing over 2,000 teachers. Australia has 2 institutions, Austria-Hungary 17, Belgium 10, Brazil 1, Canada 7, Denmark 4, France 67, Germany 90, Great Britain and Ireland 46, Italy 35, Japan 2, Luxemburg 1, Mexico 2, Netherlands 3, New Zealand 1, Norway 7, Portugal 1, Russia 10, Spain 7, Sweden 17, Switzerland 11, United States 55, Bombay 1.

CURE FOR FELON.—We give the following remedy for felons, by request of a friend who has tried it, and been saved much suffering: Use a poultice of ginger and flour, equal parts, made into a paste with cold water. Change the poultice as often as it gets dry. If the felon is only beginning to come, wind the finger with tape. Begin by putting the tape on the end of the finger, and wind it around until you get below the joint. Wind it as tightly as possible. Then keep out the inflammation by wetting in cold water. It is painful, but if the pain becomes intolerable, loosen the tape for a while. Continue the treatment for 24 hours. By that time the felon will be prevented, if applied in time.

A CAUSE OF DEFECTIVE EYESIGHT.—The colors of paper and ink, says a writer in the *Scientific Monthly*, are far more responsible for defective eyesight than cross lights from opposite windows, light shining directly in the face, insufficient light or small type. If these were remedied the principal cause of the mischief would still remain, the real root of the evil being the universally used black ink and white paper. These, says the writer in question, are ruining the sight of all the reading nations. He argues that the rays of the sun are reflected by a white body and absorbed by a black one, and that we print our newspapers and books in direct opposition to the plainest, correct principles of optical science.

THE BRAIN.—"When an impression," says Dr. R. Wood Brown, "is received upon the retina, tympanum, tongue, fingers or olfactory bulbs, it is conveyed by proper nerve filaments to cells in the gray matter of the brain. These cells vibrate from excitation and undergo a change, say that of molecular arrangement. If this impression is repeated often enough, the molecules are permanently changed, and we have memory cells and remember the impression. But repeated impressions are not always necessary to produce a memory cell. A sudden, violent excitation will cause a permanent change in a cell.

A SPECIFIC FOR HICCOUGH.—Dr. Henry Tucker recommends, in the *Southern Medical Record*, the use of the following very simple remedy in the treatment of hiccough, namely: Moisten granulated sugar with good vinegar. Of this give to an infant from a few grains to a teaspoonful. The effect, he says, is almost instantaneous, and the dose seldom needs to be repeated. He has used it for all ages—from infants of a few months old to those on the downhill side of life, and has never known it to fail. The remedy is certainly a very simple one, and although no theory is advanced to account for its wonderful action, it merits trial.—*Therapeutic Gazette.*

THE SMARTEST OLD MAN IN THE COUNTRY.—Seth Cook, of Rathboneville, N. Y., will be 103 years old if he lives until Jan. 10, 1885. On Oct. 10th he went alone to Cowanesque Valley, expecting to meet his son. When he arrived there he learned that his son was at Gaines. There was no train for that place until night. Centenarian Cook concluded it would be a waste of time to wait for it, and set out for Gaines on foot. The distance is 17 miles. He walked the entire distance in six hours, arriving at his son's in good condition, and an hour ahead of the train.

PECULIARITIES OF COLOR BLINDNESS.—Persons who are color blind are usually either red blind or green blind, and their infirmity is almost always confined to one color. Cases of violet blindness are rare, and no instance is known of a person unable to distinguish between blue and yellow. It is a remarkable fact that, while about one man in every 25 is more or less color blind, the affection seldom occurs among women, only one case having been observed by Dr. B. Joy Jeffries, in an examination of 1400 ladies.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

ARROYO SECO MINING CO.—*Ledger*, Nov. 6: This claim, better known as the Lambing gravel claim in Ione valley, is now in order to commence operations with the steam derrick lately put up on the claim by Knight & Co., of Sutter creek. This piece of machinery was completed this week, Messrs. H. G. Murray and R. McLalan having spent 64 days each in its erection. The main body of the car is 40 ft in length, set on 6 wheels and mounted on railroad iron. It is operated back and forth by machinery with double engines, and a pair of boilers. The mast is 50 ft high, and the boom of 118 ft long. The buckets hold 27 cubic ft of earth, and it is calculated to dump a bucket every 1½ minutes. This costly piece of machinery has been put up for the purpose of raising the pay dirt, so as to be able to work it to advantage.

Butte.

THE BIG BEND TUNNEL.—Oroville *Mercury*, We had the pleasure on Wednesday last of visiting that gigantic mining institution in Butte, known as Big Bend. It is safe to say, that in the immensity of its proportions it exceeds anything of the kind on this coast, and perhaps, in the world. It is about 17 miles northeast of Oroville, in the most rugged country in this vicinity. One cannot approach the settlement without admiring the great outlay of capital, and the marvelous enterprise displayed there. In the mere item of roads, which were necessary to get to the Big Bend, $25,000 or $30,000 have been expended. The mine is now supporting about 300 people. There are now about 75 men employed. The dark tunnel, the mouth of which is in Dark canyon, has now reached a length of 6,150 ft, and there are yet something over 6,000 ft to be completed. By the kindness of Messrs Harkness and Cribben we were taken to the face of the tunnel on a handcar, and were much interested in watching the drills, which are operated by compressed air. The machinery is the very latest improved. It will require perhaps two years, possibly more, to finish this great enterprise, and everybody joins in the hope that the river bottom which is to be drained contains millions to the rod. This company has dispersed many hundreds of thousands dollars in the project so far. The company is very confident that there are millions in the river, and there is every reason to believe that it will not be disappointed.

Calaveras.

SHUT DOWN.—*Mountain Echo*, Nov. 6: The Pine Log mine near Copperoppolis has been shut down, till the shaft can be sunk deeper. The rock pays well. We understand that the water is kept out of the Porter mine, with a view of commencing operations as soon as circumstances will permit. Work has been resumed on the Cherokee mine, situated near Altaville, owned by B. R. Prince & Co. This mine was in early days, one of the richest mines ever discovered in this county. Several carpenters are at work building the hoisting works on the Stickle mine. The work of grading off the ground is nearly completed, and a part of the machinery has arrived. As soon as the hoisting works are completed, the shaft will be cleaned out—and work will commence in good earnest.

SOUTHERN ITEMS.—Calaveras *Prospect*, Nov. 6: The Marshal mine, near Altaville, is said to be making flattering returns to its proprietor, and ever since the mill started it has been crushing constantly, except during the time the water was shut off from the Union Water Co.'s ditch. This mine has excellent facilities for milling, and has one of the finest 10-stamp mills in the county. The Cherokee mine, the property of B. R. Prince, lies about two miles from Altaville, toward the southwest, and is located on the famous Angels lead, or the continuation of the Mother Lode of California. Some years ago a shaft was sunk in this mine to the depth 120 ft, showing most flattering indications of riches, but owing to the lethargy in mining enterprises which prevailed at that time, further operations were suspended, and like many other good mines it has been allowed to remain idle. At present preparations are being made for opening up the mine, and a boiler, an engine and other machinery are on the ground for preparing work. Another little mine which is worth a small fortune is the Gold Hill, situated on Smith's Flat, one and a half miles from Altaville. This mine is owned by John Osborn, and he is working it upon a slow but economical plan. He has a one-horse arastra, and the clean-ups are generally more than good. A tunnel 220 ft in length taps the lead, which is about 55 ft from the surface. A lead known as the Patch Quartz-mine, a continuation of the Gold Hill and adjoining it, has been recently purchased by Sam Osborne. As soon as there is abundance of water a hydraulic will be put on to wash off the surface. In San Andreas people are placing great confidence in the management of the mine, near Donnallan's bridge, until recently known as the Hamby mine. There are at present about 20 men employed in opening up the mine. The ditch to convey the water from the Mokelumne Hill ditch to the mining ground has just been surveyed by Captain Beauvais. Several buildings, for the accomodation of the men, and a business office, have been erected. The mine bids fair for something encouragaining before long.

Inyo.

RICH SPECIMENS.—Inyo *Independent*, Nov. 9: A few days ago Joe McDermott brought in some very rich specimens of gold-bearing quartz from Freeborn canyon. Some of the specimens are from the Golden Reef mine, and some from another mine in the same locality. The claims were originally located by Peter Taylor, several years ago.

Mono.

BODIE CON.—Bodie *Free Press*, Nov. 10: During the past week there was worked at the mill 157 tons of ore. The average assay value of the pulp is $222 per ton. About 12 per cent is lost in the tailings. These tailings are being carefully saved. In cleaning up the battery a large amount of bullion is found which does not show in the pulp assays. At the mine the south drift, 200 level, is in 62 feet; the south drift 550 level, is in 124 feet: the south (Mono) is in 100 ft; the joint west crosscut is in 43 ft; 41 men employed at the mine.

MONO.—The Mono winze below the 600 level is down 52 ft. They have run a drift south on this level which is in 20 ft. They get very rich bunches of ore in this drift. Native silver is to be seen in it. An assay from the good rock went $385.46. The ledge is broken up some, but is now getting solid. The south drift, 550 (Lent shaft) level, was extended during the week 20 feet. The face of the drift shows a mixture of quartz and porphyry, the quartz giving low assays, Eight men are employed.

STANDARD CON.—Extracted and shipped to the mill 480 tons of ore and 600 tons of tailings. Received from the ore 485 ounces of crude bullion and from the tailings 240, which will be melted and shipped with the week's run. North drift from upraise No. 2, 385 level, in 65 ft; progress, 13 ft: the vein is three ft wide. Upraise from south drift No. 1 is up 78 ft; progress, 14 ft, showing 18 inches of vein. Are stoping from upraise No. 1, 500 level.

BULWER CON.—Upraise from south drift No. 3, 385 level, is up 150 ft; progress, 13 ft. The vein continues about six inches in width.

SWEETWATER PROSPECTS.—Virginia *Enterprise*: Patterson district—familiarly known as "Sweetwater"—in Mono county, appears to be coming to the front as a bullion producer. Many experienced miners confidently assert that a second Comstock has been struck, the geological conditions being almost identical. Two mills are at work in the district, and are putting out considerable bullion. The ore is high grade and free-milling, and so much does it resemble Comstock ore that it is not only difficult but impossible to distinguish the difference. The prospect is that there will be a large mining town there before many months, though there is at present a sprightly little camp near the principal mines.

Nevada.

THE HORSESHOE MINE.—Grass Valley *Union*, Nov. 9: The Horseshoe mine on Wolf creek is turning out good rock, which shows well in free gold and fine-looking sulphurets. The ledge in the shaft is from 8 to 10 inches in width, regular and well defined. The Horseshoe is an excellent prospect, and the stockholders feel that they have good reason to feel very much encouraged over the showing.

MORE RICH ROCK.—Yesterday some very rich quartz was being taken out at the Peabody mine, the gold being heavy and in beautiful streaks and bunches in the rock. The vein from which it was taken was 9 inches in size, and a section of 20 ft which had been stripped showed all the rock to be of high grade.

FEDERAL LOAN MINE.—Mono *Transcript*, Nov. 9: Wm. Avery is pushing ahead as fast as he can the development of the Federal Loan mine on Deer creek, four miles above town. Water power is to be substituted for steam in running the hoisting works, which change will effect a material saving in expenses. In cleaning out the old drift at the 125 ft level some splendid ore was found. The incline is being sunk to a depth of 200 ft, where a new level will be started.

RICHER THAN EVER.—Grass Valley *Union*: The richest rock yet taken out of the Peabody mine came out yesterday. Some of the pieces were nearly half gold, and some pieces of plate or leaf gold came along with them, with no quartz attached to them. About a half a carload of very rich quartz was taken out during the day. The exhibition of some of these gold and quartz specimens at Weissbein's bank created quite an excitement. The ledge from which this rich showing is made is from 8 to 10 inches in thickness. Supt. Bennallack says the next crushing will be a remarkable one.

THE PEABODY MINE.—*Tidings*, Nov. 8: The Peabody mine is doing its full duty to the town and to the whole country in sending out gold. This morning the ore sent to the surface is filled with free gold, and has also sulphurets that will yield immensely. The ledge is fully nine inches in thickness and is between beautiful walls. The ore is so rich that much of it is stored in the vault at Weissbein's, just as gold is locked up. Mr. Bennallack, the superintendent of the Peabody, says he has seldom seen such a showing in a mine and he has never seen the showing surpassed. The Peabody will certainly pay $5 to the share dividend for the current month and have money left over for a reserve fund.

San Bernardino.

KRAMER MINES.—Calico *Print*, Nov. 6: Yesterday J. L. Coffman, who has mining interests at Kramer station, called at this office, and from him we obtained the following items concerning that camp and vicinity: Work is progressing in the Belden mine. They are down 20 ft. The ore is becoming more solid in character, more regular in quantities and richer in quality. General E. E. Hewitt and Messrs. D. Campbell and Palet, of Los Angeles, who are interested in the largest group of mines in that district, are expected to visit the camp next Monday. Mr. Coffman and his partner, J. R. Maxey, recently discovered a gold ledge about five miles south of Kramer. They have sunk ten ft on the same and a sample from that depth assayed $70·35. The ledge is three ft wide and contains two ft of solid quartz. It is their intention to put up a windlass next Monday. Mr. Maxey also discovered a ledge six miles south of the gold find last Thursday, the croppings of which assayed $5.50 in silver.

NEW SAMPLING WORKS.—Yesterday Mr. C. J. Perkins returned from Albuquerque, New Mexico, where he had been absent a week on business. He did not see any camps in Arizona or New Mexico that compare with Calico in activity and prosperity. He informed us that a company of Arizona and Denver capitalists are making arrangements to build new sampling works in Daggett, and will have the same in operation within ninety days. It is the intention of this company to pay cash down for ore delivered to them, and from 10 to 20 per cent more than has ever been paid for ore in this district.

BONANZA KING.—Superintendent's Letter, Nov. 7: The northwest drift on vein No. 3, seventh level, is ten ft in length; the ore is confined to a small seam. I have started a winze on vein No. 1 and have two ft of fair milling ore in sinking. Both east crosscut and north drift on the sixth level show small quantities of ore in the face, but not in sufficient quantity to pay. The north drift on the fifth is in ore of fair milling quality. We have started to sink a winze in the north drift on the ore vein 20 ft back from the face. The ore body in the south winze changes its course so that it is impossible to sink on it. I will have to sink this winze on the general course of the ore and take the chances of finding it when the winze is connected with the seventh level. The ore vein in the north drift at the head of the big winze is producing well. The tunnel level winze continues in ore of good grade.

NEW YORK DISTRICT.—John McBride, Wm. Miller and J. S. Rainey left yesterday for the New York district, and will remain there an indefinite length of time. They took a large amount of supplies with them and are prepared to work on a larger scale than ever before. The mines under their control are undoubtedly extensive and valuable, and we have every reason to believe that their undaunted pluck and energy will make them the honored founders of a rich and flourishing camp.

MENIFEE DISTRICT.—Colton *Semi-Tropic*, Nov. 4: W. E. Campbell, one of our well-known mining experts, has been spending several weeks in the Menifee mining district, investigating properties in that locality, and he is so well pleased with the mines and the prospects that he has secured control of the "Jim Crane," an extension of the rich Menifee lode, and a number of other mines. The Jim Crane ledge is deemed to be even a better property than the original discovery, and many of the other lodes Mr. Campbell has taken hold of are reported equally as good. We are pleased to see such men as Mr. Campbell taking hold of these mines, as it gives us an assurance that the property there has true merit, and is worthy the attention of capitalists who are seeking investments in good mining property.

Sierra.

EMPIRE.—*Mountain Messenger*, Nov. 8: The Empire Company, of Howland Flat, are getting good pay. The boys deserve good luck for persistence under adverse circumstances. Work is progressing rapidly on the new quartz mill in Slug canyon. Nearly all the machinery and lumber is on the ground, and the completion of the mill this fall is assured. Mr. Cross himself was up from Nevada City, Wednesday. The mortars are down and on the ground where the mill is to be put up at Jerome York's quartz ledge in Slug Canyon. The stems, cam shaft, 5,000-ft building timbers and those for the foundation are there. In a few days grading will be done for the mill. Work has been commenced on the two flumes, one 700 ft and the other between 800 and 900. The new shaft is progressing very steadily at the Marguerite. A large crowd of men are employed by the Sierra Buttes Co. now, more than there have been for a long time.

BALD MT. EXTENSION.—Some gravel was cleaned up by the Bald Mt. Extension Co., Forest City, this week, that prospected rich in coarse lead gold from beyond the lava flow. The work of putting in the pipe and steel rail still progresses. Mr. Van Slyke has his sawmill in Butcher Ranch nearly in working order. He bought the old Gold Valley mill and removed such parts as he required to the present site. The mill is to run by water, and the ditch to bring in Butcher Ranch creek is completed, and when a few boxes are laid to bring the water around a rocky point, the mill will start up to cut the lumber to inclose it. In the spring Mr. Van Slyke will build a quartz mill near the sawmill, to cut lumber for which the mill was built. Quartz will have to be hauled about a mile, all the way down hill. The rock in the shaft holds as rich as ever as they go down.

Siskiyou.

ORO FINO.—Cor. Yreka *Union*, Nov. 6: I have been away two weeks prospecting a mica ledge, which lies west of the valley on the Salmon range of mountains. We succeeded in running a 40-ft tunnel, but have not found any casings yet. We estimate the lode to be 60 ft thick. We find an abundance of mica, chrome, iron, etc. Wright & Fletcher have a quantity of large pipe on their claim, and intend putting on a lifter. Eastlick Brothers expect soon to receive their iron for making 15-inch pipe, which they will place in their claim this season. C. L. Lewis has bought into the Eastlick quartz lode, and removed to Oro Fino, and will engage in mining during the winter and coming spring. The mine is situated one-half mile north of Oro Fino, and prospects remarkably well.

Trinity.

AN IMMENSE WORK.—Trinity *Journal*, Nov. 8: During a brief visit to Junction City a few days ago, we took a hurried look at the immense work which is being done there, and now nearly completed, under the superintendence of E. M. Benjamin, and for the purpose of carrying water from Canyon creek to the Hayes Red Hill gold mines. It is impossible at this time to give a description of the work, but the laying of the pipe down the bluff to the river, the noble suspension bridge and the other things which have been done, constitute the grandest mining work in Trinity county and one of the leading ones of California and of the world. The laying of the pipe down the bluff and across the river has been under the direct management of J. R. Flagg, and it has been well done. He will also have charge of the mining operations. Mr. Benjamin has thus far kept the bridge open to the public, but now that the pipe is laid, he has been compelled to close it, as the swaying occasioned by constant travel would surely result in damage.

VERY RICH.—The richest quartz specimen we have yet been favored with came from the mine of Hurlburt & Newman, on Eastman gulch. It is small, but full of gold.

Tuolumne.

PUMPING.—Cor. Tuolumne *Independent*, Nov. 6: Orders have been received from the company at San Francisco, to pump the water out of the Black Oak mine, at Soulsbyville. The pump was started the 4th of this month. No doubt they will do something with it now as it has been idle for some time. By the prospects, it is no doubt, a good mine.

NEVADA.

Washoe District.

OPHIR.—Virginia *Enterprise*, Nov. 8: Good progress is being made in the drift on the 500 level, and it will soon tap the old works. It has already tapped a considerable flow of water, (now decreasing) which came from a pocket in front of the east wall of the vein. In about eight days they will reach the old workings. Some low-grade ore is still being taken out from the 250 level. The south drift on the 1500 is making about 60 feet a week in rock of a favorable character. The station at the 3300 level has been completed, and a diamond drill hole has been run to the west about 300 ft, nearly all the way in dry ground. The material is a mixture of quartz and porphyry. They are now running a diamond drill hole to the southward.

SIERRA NEVADA.—The north drift on the 3000 level is cutting some very good ground. In this part of the mine are some streaks of quartz that promise well, assaying from a trace up to $40. On the 3300 level, at the joint Ophir, Mexican and Union Consolidated station a diamond drill hole was run over 300 feet to the west, nearly all the way in dry ground. They are now running to the south with the diamond drill. The indications are that the level will be a wet one, though to the west lies a considerable breadth of dry ground.

COMBINATION SHAFT.—The working station at the 3000 level is completed, and the next thing in order is the cutting out of a pump station. The new hydraulic pumping machinery constructed at the Risdon Iron Works in San Francisco for this shaft has been completed, thoroughly tested, and is now being shipped to this city.

HALE AND NORCROSS.—The station at the 2900 level in the main winze is completed, and the winze is now down nearly half way to the 300 level. It is expected that orders will shortly be received from below to start crosscuts on the 2800 level. On the 200 level they are obtaining the usual quantity and quality of ore.

ALTA.—Owing to the steady flow of water no work has been done in the drift on the 2150 level for several days. The pump is running at from 6½ to 6¾ strokes per minute. This water is evidently coming from the vein, and all there is to be done is to keep the pumps going and wear it out. The above will apply equally well to the Benton.

MEXICAN.—At the 3300 level of the joint Ophir Sierra Nevada and Union Consolidated winze, a Diamond drill hole was run over 300 feet in dry ground, when some water was encountered. The drill is now being run to the southward and is finding some water.

EXCHEQUER.—The principal work at present is on the 900 level. They have a large body of quartz extending from near the surface to an unknown depth. All of this quartz yields promising assays—assays running from a mere trace to as high as $10. At some point it is hoped to find this scattered metal in a more condensed form.

SAVAGE.—The tunnel from E street will soon cut through the vein at a depth of about 200 ft, and in the range of the rich upper deposit in the Hale and Norcross. A crosscut, which is being run west by the Gould and Curry Company on the Savage north line, will prospect the mine at the depth of 825 feet.

GOULD AND CURRY.—The west crosscut at the north line of the Savage is progressing well and is in a favorable formation, composed of a mixture of quartz, clay and porphyry. There is to the west, on this level, a large tract of unexplored ground.

OVERMAN.—Sufficient low-grade ore is being extracted from the old upper levels to keep the Vivian mill in operation. This ore is being taken out through the old Petaluma street tunnel, and from a point about 200 ft below the surface.

UTAH.—The southeast drift on the 1950 level is in a very favorable formation of vein porphyry, showing seams of clay and streaks of porphyry, but as yet no quartz has been found that carries more than a trace of metal.

BEST AND BELCHER.—The west crosscut at the north line of the Gould and Curry, on the 825 level, is out over 100 ft, and is passing through vein materials—quartz, clay and porphyry—that promises well.

YELLOW JACKET.—The yield of low grade ore continues sufficient to keep the mills going. Exploring drifts are kept going for the purpose of opening up ore in advance of those engaged in its extraction.

SCORPION.—There is no change worthy of note in the material encountered on the 500 level in the north drift. The ground is dry and blasts very well.

CON. VIRGINIA AND CALIFORNIA.—On the 1750 level rapid progress is making in the northwest drift. As yet no crosscuts have been started from this drift.

ANDES.—A considerable amount of low grade ore is being taken out on the north drift. The west drift is showing good material.

CROWN POINT.—Sufficient ore is being extracted on the old upper levels to keep the mills on the Carson river in operation.

BELCHER.—About the usual amount of low grade ore is being extracted and sent to the mills.

Columbus District.

MOUNT DIABLO.—*True Fissure*, Nov. 8: During the past week the incline has been sunk 12 feet, and is now 394 feet below the third level, and it will soon be low enough for cutting out a station for the sixth level. The north crosscut from the west drift on the fifth level has been stopped, after reaching a length of 53 feet, and a drift started east on a streak of $100 ore cut by this crosscut. The west drift on the fifth level is in 57 feet beyond the winze No. 1, and the face shows a little ore, assaying $30 per ton. A west drift on the fourth level has been started from a north crosscut east of the shaft, and is showing some low grade ore. The intermediate, from winze No. 6, between the third and fourth levels, shows a small streak of good ore.

Delaware District.

THE EDISON MINE.—Virginia *Enterprise*, Nov. 8.—A. D. Bullard has out on the dump of the Edison mine, Delaware District, another lot of rock which he will soon send to the mill. A former lot worked at the Merrimac arastra mill paid a good profit. The present lot assays $42.07. The ore contains a good deal of free gold. Delaware District lies to the southward of the Carson river, and very little work has ever been done there.

Eureka District.

ORE.—Eureka *Sentinel*, Nov. 8: Stinson & Co. made a shipment of 86 tons of ore from their tribute pitch in the Hamburg mine to the Richmond fur-

naces a few days ago. Maurice Hartnett has brought in specimens of very rich ore from the Industry mine. It is a milky white soft chloride, and is very seldom found on Prospect mountain. They are taking out some extremely rich ore, and lower grade ore in larger quantities. H. S. Rickard & Co. are shipping five tons of first and second class ore to the Richmond furnaces from the Rescue mine. The first class is very rich, and the second class runs over $200 per ton. The third class, of which there remains a large quantity, will be shipped later.

Gold Canyon District.

A VALUABLE DEPOSIT.—Virginia *Enterprise*, Nov. 8: In the gravel deposits in Gold Canyon, below Silver City, and on the large flat at and beyond Johnstown, are found immense quantities of black sand and iron stones. So abundant is this iron gravel and sand that it has always greatly interfered with sluice mining. The iron sand and pebbles so pack at the bottom of the boxes that the gold (which is very fine as a rule) cannot get down to the quicksilver. With ordinary sluices, as much gold is obtained by cleaning up after running an hour as would be found at the end of the day. Of late the white and Chinese miners working in the canyon have used grizzlies, and have placed blankets in their sluices. In this way they have managed to make fair wages, but have still had great trouble with the black sand. There are literally tons of the iron sand and iron gravel and cobble stones. Many rounded masses of iron are encountered that are as large as ten-pin balls. In view of the good results obtained from a similar iron sand in the Snake River country, the *Enterprise* some time since suggested that it would be well to give the iron sands of Gold Canyon a thorough test. Thomas Mack, of Silver City, now informs us that he has done this. He saved a quantity of the black sand on blankets and carefully worked it in pans. He says it is necessary to grind the sand very fine. When this is done good pay is obtained. He says he obtained more gold from the sand worked in the pans than was saved in the sluice-boxes. He says the iron stones will pay as well as the sand, being the same material and evidently from the same source. About and below Johnstown there are acres on acres of this placer ground. It shows fine gold at the grass roots, and all the ground is full of black sand and iron gravel. Doubtless all this ground will be worked at no distant day, and all the iron rock and black sand saved and reduced by mill process.

Granite District.

GOLD.—Virginia *Enterprise*, Nov. 8: Fred. Gotchet arrived at Eureka recently from White Pine, bringing in ten pounds of gold. At $17 an ounce, this gives him a clean-up of about $2,000. His mine, the Oro, is located in Granite District, about twenty-two miles from Cherry Creek. The property has not been explored to any considerable depth. Gotchet says that the expense of working his gold quartz is almost nothing. Outside of the cost of grub and extraction (the latter being slight, as the ore is taken from a tunnel run into the ledge), the whole expense of getting out his last shipment of $2,000 was only $150.

Pinto District.

NOTES.—Eureka *Sentinel*, Nov. 8: Andrew Berryman and Tom Mellon are still at work in the Silver Nugget mine, Silverado mountain, Pinto district. John Steele is shipping seven tons of high-grade ore from the Diagonal mine, Silverado mountain, to the Richmond furnaces. Jim Nolan and Wm. Bowen have a good prospect in the Great Republic tunnel, Silverado mountain. The tunnel is in about 575 ft.

Rebel Creek District.

PROSPECTS OF THE MINES.—Cor. Eureka *Sentinel*, Nov. 4: Fifty-two miles north of Winnemucca, on the stage road to Silver City, I. T., lies Willow Creek. Leaving Winnemucca at 2 o'clock P. M., you reach Willow Creek Station at midnight. A fine stream of water comes from the mountains just in front of the house and is lost in the desolate plain which stretches away for miles behind it. Willow Creek Canyon, wherein the mines are situated, cuts into the hills directly in front of the house. The formation is principally slate. For five miles up the canyon you pass claim after claim, most of which have been merely scratched, the enterprising proprietors finding too great an attraction at the station to devote much time to the development of their claims. I never saw a camp about which so much has been said and where so little has been done. The ore is quartz, carrying more gold than silver. The veins are not clearly defined, as they mostly run parallel with the country rock and are badly broken and mixed up with the slate ledges. Every claim can show pieces of quartz rich in free gold, but the average of the veins is not high. There are some claims in the district which bid fair to become good mines. One in particular, the Ohio, which has just been sold to a Salt Lake Company, returned $300 a ton net. One or two other claims upon which considerable work has been done, are looking finely, and as depth is attained, silver predominates. It is very hard as yet to judge the merits of the camp, as nothing more than assessment work has been done on most of the claims. In the canyon is a five-stamp mill, owned by the most enterprising men of the place—McColley and McLaren, but they find it difficult to get ore enough to keep it running. The mill has a complete outfit, with room for ten more stamps, a fine assay office, boarding house and a blacksmith shop. We have plenty of water.

Sprucemont District.

A FURNACE FOR SPRUCEMONT.—Elko *Independent*, Nov. 8: Willis G. Dodd, mechanical engineer for the Pacific Iron Works of San Francisco, who came down from Sprucemont, states that arrangements for the erection of a smelting furnace on the eastern side of the mountain, for Harrell, Scherff & Co., for the reduction of ore from their mines, have been made. Mr. Dodd was on his way to the Bay, and at Truckee will order the shipment of lumber necessary for the construction of a building to inclose the furnace. Water for supplying the furnace will be brought in pipes a distance of four miles. The mines are reported as being immense, amply justifying the heavy outlay contracted by the company.

Tuecarora District.

GRAND PRIZE.—*Times Review*, Nov. 8: East crosscut from south drift in the 400-foot level, is in 55 feet; progress for the week, 19 feet. Stopes producing sufficient ore to keep the mill running steadily.

ALMOST SOLID BULLION.—*Times-Review*: At the Navajo office there are six or seven chunks of ore aggregating about 150 pounds, which are probably nearer solid silver and gold than any pieces of the same size than were ever extracted from any mine in the State. They were thrown from the ledge by a single blast. There are pieces weighing 30 pounds each which are literally masses of horn silver flecked with gold. The value of specimens on exhibition is upwards of $2,500. The sight has attracted a large number of visitors to the office, and it is the unanimous expression among old miners that such a showing was never before made in the same ore compass in the palmiest days of the Comstock lode.

ARIZONA.

NOTES.—Tombstone *Epitaph*, Nov. 6: The Girard mine has shut down for the present. The cause of the suspension was not learned. It is understood that the Bonanza company intend purchasing the Harshaw mill, and removing the same to Quijotoa. C. B. Johnson, the well-known miner and prospector, came in from Bisbee Saturday evening. He reports the copper camp booming.

ORE.—Prescott *Courier*, Nov. 7: Wager Bros., of Humbug district, are making regular shipments of ore from their mine in Humbug district. The Hellings 10 stamp mill, erected at the Vekol mine, Pinal county, will be ready to start up by November 15th, on the biggest ore dump in the Territory of Arizona, there being no less than 6,000 tons of ore that will mill over $40 per ton. The mine is now the property of the Walker Bros., P. R. Brady sold his interest.

COVERED WELLS.—*Sunshine and Silver*, Nov. 8: We have frequently drawn attention to the mineral deposits around Covered Wells. The following is an extract from a letter from D. M. Hyde, an old Pinal county prospector, who is now mining in that district. "This is proving to be a good place, and the few men working here are doing well. They all have ore in sight and it goes very high in silver. I consider it a good place for prospecting. A man that will come here and go to work is pretty sure to strike something good. Many have done it lately and others can do the same, if they will come and try. Nobody works here long unless they have ore in sight. What we need most is a small custom mill. I believe that it could be made to pay well if rightly managed. Several have talked about building one, but thus far it seems to be all talk. A great deal of ore is taken out here that would pay well in a mill, but it is hardly rich enough to ship away to Denver and other places. There has been some talk of putting up a store here—a thing that we need very much, as it is quite a task to have to go to Logan City for our supplies. There will be a good many men at work here in a month's time doing their assessment work."

CARLISLE.—Tucson *Star* Nov. 4: Some important strikes have been made in the Carlisle during the past week. On the 300 level a body of ore has been encountered which shows up free gold like the old time surface workings and assaying in the thousands. On the 400 level, the ledge has been tapped, and the immense body of ore was encountered. Without finding another pound of ore than that in sight the mill need not stop for the next two years.

COLORADO.

MINING NOTES.—Colorado *Miner*, Nov. 8: The Pioneer mill is running steady on ore from the Pioneer lode. The Dives mine is still maintaining her excellent product. Fifty men are employed on the property. Work will be resumed this month on the Lafayette, Hudson and Delaware lodes on Griffith mountain. The shaft on the old Hudson lode on Columbia mountain, is being cleaned out preparatory to sinking. A new discovery has been made at the head of Spring gulch in which the surface quartz shows well in gold. About 24 tons of concentrating ore from the Colorado Central mine has been treated at the Pay Rock mill as a test. During October the Baltimore produced $27,000. A mill-run of 40 tons of ore was had at the Public Ore market last Saturday, which returned $15,840. A tunnel has been started from the toll road on the south side of Republican mountain to intersect the East Ben Hardin vein, which has been opened up from above. The Baltimore is producing extraordinarily rich ore in large quantities. Each lessee in the mine seems to be doing well. One party of four lessees, working 8 men, took out over $14,000 last month. W. H. Robertson has made a new discovery at the head of Spring gulch. The surface quartz pans well in gold. He is now sinking a shaft the required depth, and will prospect the vein on the surface west of the shaft. A 5-ft streak of mineralized quartz, which assays 40 ounces silver to the ton, is shown in the bottom of a 25-ft shaft on the adit of the Columbian lode, in Beaver gulch. The property is owned by Jesse Ward. Hoisting machinery has recently been placed over the shaft on the Tenth Legion mine at Empire, and all kept busy getting the mine in good working condition. Messrs. Barrett & Fletcher hope to produce enough ore from this property to keep their mill running day and night. Col. John M. Dumont is developing several lodes on Silver mountain with flattering results. He has none but the best miners and is working 40 men in mines, mill, and constructing roads. If his mines develop as they promise, it is said that he will build a mill or smelter next season. An immense strike is reported in one of the Horseshoe mining claims, on the Pacific side of Argentine pass. Nine inches of ruby silver and silver glance have been exposed, which bids fair to prove extensive. This property is owned by a Rochester, N. Y. Co., with Thomas Cunningham, an experienced miner, in charge. The latest strike is reported from Swan district, Summit county in what is known as Brown's gulch, between Lincoln City and Swan, near Breckenridge. The crevice is 12 ft wide and the mineral is all through it. It assays $232.53 and mill-runs $128.41, both by Mr. Burlingame of Denver. An assay of ore was made by Mr. Doty, of Breckenridge, which resulted, gold $12.02, and silver $252.80.

IDAHO.

BAYHORSE.—Idaho *Messenger*, Nov. 4: The old stack was started up anew on the 24th ult, and was running steadily when we left. There is a large amount of ore ready on the ground and an immense pile of coal. The ore is of a superior grade, and, of course, a little hard of reduction; and having a lack of power Messrs. Gilmer & Salisbury have concluded to add materially to this by putting in steam. They have a fine engine already set and are making all necessary building and improvement for its use. When this is completed it is expected both stacks will be run to full capacity; and from the abundant supply of ore and coal, all parties are anticipating a steady run of the full smelting force in this camp through the winter. If this should be the case, everything will be changed. The old style of shutting down and stopping the most of the business for nearly half the year will be altered into active life the year round.

THE POST-BOY.—Our readers, and especially the neighbors in Custer county, will be pleased to learn that this mine is opening to a great width and is also becoming very rich. This has been long predicted, and especially by Mr. Newman, one of the former owners. He often said to us, when he sold it as a prospect, that it would outdo the Ramshorn whenever it was more fully developed, and gave me his reasons for selling it so low, and at the same time entertaining that opinion of it. The Post-Boy is a part only of the great lead that is yet, far more than in the past, to astonish a world with its richness. Everywhere in this camp good reports are given, where there is any work being done. The Beardsley is being pushed in the way of development work and gives its usual good promise for the future. There is no doubt as to a good future for this grand old mine. It was one of the first and will be one of the best of mines in this camp. The Excelsior is working only a few hands, but is, as ever, looking well. The Clayton smelter, where the product of this mine is reduced, is already burdened with ore, and the owner deems it more judicious to stop taking out until it can be worked.

THE SILVER CREEK.—This mine is situated on the north side of Bayhorse creek, about a half mile above town. The owner, Mr. Edward Dunphy, has been tracing the indications about four years; but now he is rewarded for his patient toil by a mine that he can take $25,000 for at any moment. He will not sell at that figure. And the indications now are that if he does he will miss the mark. There is but one line of work, consisting of a tunnel of very large size, run on the line of the ledge with more or less ore the greater portion of the way, about 175 ft in length. For 40 ft, perhaps a little more, the vein and ore have been very marked, while at the extreme inner end, at present workings, the vein is six ft, three ft of which is a glittering, solid and well defined vein of galena and grey copper. The sight at the point of work, that near the surface, surpasses anything we ever saw before, with the exception of the Cinnabar, owned by Kirk Bros. This has the advantage of being almost within a stone's throw of good reduction works; and near to where will soon have to be erected, without doubt, by far more extensive works of a similar nature. The earth is indeed opening well. Reduction, necessarily, will follow. This mine lies embedded in black shale lime, has a present appearance of striking north, or nearly so, with a dip west, at an incline of about 20 degrees from a horizontal plain. It lies about 2,000 ft below the Ramshorn cluster at the top of the mountain, and has every indication of strength. If it does not prove an abiding, rich and vast mine we shall be wonderfully disappointed. Its record, undoubtedly, ten years from to-day will be in the millions—net. The Bullion, situated on the south bank of Bayhorse creek, just above the town, is a little nearer the reduction works than the Silver Creek, and is owned by the Dougherty Bros. and C. E. Taylor, and will probably prove to be on the same lode. This claim has been taken up for years, and frequently been discarded as bad. The Messrs. Dougherty had run a tunnel 175 feet a year or more since, and being disheartened, had left it for other claims, which they thought more favorable, but still meeting with discouraging results, returned to the old location. While fitting for a winter habitation a few days since, they came upon the real vein cropping out, or very near the surface, for more than a hundred feet in length. It lies in lime shale, and bears signs of copper, still the mass of ore near the surface is galena and carbonaceous. The whole appearance now foretells a carbonate mine with small grey copper, or copper glance veins rich in silver; and, perhaps, considerable copper, at greater depth, with less silver in its mixture. The vein is about three feet in width on the whole, and is so well filled with galena streaks and carbonates that two men are taking out and sacking from one to three tons of the better grade of ore per day, beside piling up a number of tons per day that will be of good value hereafter. This is so near that its products can be tramwayed into the reduction works in case of its proving to be a mine equal to its present showings. Its strike is north with a west dip, but with a very slight degree, indeed. It is very promising, and having been so recently discovered to be of value, gives great cheer, not only to its owners, but to the camp and prospectors, generally. Our miners will learn after a while that the best mines to be discovered are at home, in Custer county, and not a thousand miles away. The only advantage in our miners going off an extensive distance and getting far inferior mines to be found at home, is, that those long and less lucrative trips have about them a pleasing novelty.

SILVER.—Cor. Salt Lake *Tribune*, Nov. 6: Coming up Lemhi river, we next find the new silver bearing mines discovered this summer near Junction, which are not worked much at present, but may be in the near future. To the north of these is the Texas district. Among the many owners in this rich district are J. P. Clough and J. F. Ramsden. A concentrator is to be erected at this place soon, which will greatly facilitate operations and help all concerned.

MONTANA.

BIG MINING SALE.—Butte *Miner*, Nov. 5: Last week a big sale of some of the gold mining properties of the Bannack-Marysville district was made. Phil Shenon, of Dillon, disposed of his gold properties in that district to Mr. J. B. White, of San Francisco, Cal. The mines embraced in the sale consist of a number of the best known gold quartz lodes in district, in which immense bodies of ore are already developed and awaiting extraction. We understand that the price paid was $40,000—a part down and the balance in a few days. It is the intention of the purchasers to commence mining operations immediately. A large mill will be erected to crush the ores, and the mines will be cheaply and expeditiously worked by the aid of the most approved modern mining machinery. The sale of these extensive and valuable mines was effected through the agency of J. P. Ewing, a well known mining operator on this coast and throughout the Rocky range of mountains.

MELROSE NOTES.—Cor. *Inter-Mountain*, Nov. 6: The Cleopatra mine, owned and operated by the Hecla Consolidated Mining Company, is looking better at present than ever before. About 150 men are employed in the mine, sinking and drifting in five different directions. The ore body in the bottom of the incline has recently increased considerably in width and continues to widen as depth is attained, also being of a much higher grade than heretofore. The output is about 60 tons of first-class and 65 tons of second-class ore daily. The incline is now 1,200 feet deep and sinking is being vigorously prosecuted, about four feet per day being accomplished. Six teams transfer the ore from the mine to the smelter, making two trips a day. The recent addition of a 25-ton furnace to the smelter will materially increase the output of bullion as soon as it is in good running order. The concentrator was closed down last week for the winter, in order to allow the concentrating ore to accumulate for a big run, commencing early in the spring. On the 13th ult., a train of 14 loaded cars was started down the tramway, and when but a short distance from the starting place the brakes for some unaccountable reason, failed to do their duty, and the train started down the grade at a tremendous rate. In order to make everything as securely as possible one man is sent to every two cars, there being seven men on the runaway train. When the cars started the men all set their brakes, but seeing they were unable to do any good all jumped off, miraculously escaping any injury whatever. The train, after running 100 yards, came to a sharp curve in the track which threw every car from the track, tearing the snow shed down for a considerable distance and wrecking 10 of the cars, probably beyond repairs.

NEW MEXICO.

ORE.—Lake Valley *Herald*, Nov. 8: The work of filling the contract of 12,000 tons of ore has progressed during the week at the rate of 15 cars a day by working night and day. The night force has been dispensed with and 10 cars are now loaded daily. At the beginning of the contract there were some 7,000 tons on the dumps, the balance of the contract is being taken out rapidly from the Grande. Several very rich mines have lately been discovered in the Burro mountains, near Lordsburg, in Malone and Gold Hill districts. The ore is high-grade, chiefly free milling, and carries gold and silver. In the Wilcox district of the Mogollon range, a rich gold strike has been effected. The mineral also possesses fair quantity of silver accompanied by galena. The White Oaks mines continues to turn out gold bullion. Tijeras canyon mines are now competing for the local coal trade at Albuquerque.

THE SAN ANDRES.—Rio Grande *Republican*, Nov. 8: Caradoc Hughes and Andy McBride are still at work on the Vidette and Vindex and have a good dump of ore ready for shipment. Several wagon loads were hauled to the Organ smelter two weeks ago, and an average assay taken from them gave 30 per cent copper. The ore carries more or less silver and gold, and is a sulphide of copper. The ore now to be shipped contains some oxide, or cuprite, and will run higher. The Vidette has a shaft down 100 ft, and a cross-cut will be made to show the width of ore. At the last place cut it was 2½ ft, with 3 or 4 ft of quartz, making a large vein. The ore separates from the white quartz in a regular manner. They have 5 claims on this vein showing the same ore. A very fine copper vein is the Tiptop, owned by Joblin, Shryock and O'Conner. In this group is the Garfield, owned by Hoopes and Ropes, which has a 12 ft shaft showing galena running 64 ounces silver and two-fifths of an ounce in gold. The formation is mica-schist. The canyon is called Hospital gulch. Rudasill and Shuford have been working their claims in Lost Man's gulch, where they also have rich copper ore. They have worked 13 assessments and are moving to Bear canyon to work several more. They are both workers from "away back" and are meeting with great success. In Membrillo canyon Mayberry and McLaughlin have the Saratoga and Midnight Circle. The former is down 15 ft, showing 22 inches of copper ore in a 5-ft vein. A wagon lode of this ore gave a mill-run at the Organ smelter of 27½ per cent copper. They have four good springs of water, and are a mile from Riley's ranch.

FROM ORGAN.—The Crescent City is in fine shape. The Black Prince is now showing up a good body of ore. The Climax and Grey Eagle have improved a hundred per cent recently. The Ben Nevis is putting out rich silver ore which carries nearly an ounce in gold. Work has started again on the Jay Gould, which looks well. Nine men are employed. At the Memphis, the shaft above the house is down 90 ft, and the ore is coming in wide. The walls are 7 ft apart and very regular. Bob Mayberry has come down to work on the Little Buck, McCowen is getting out high-grade ore again, and several men are at work there. A great many are working their own claims; but few are earning wages at present. This makes the town dull, but the mineral outlook is satisfactory.

UTAH.

MILFORD.—Cor. Southern Utah *Times*, Nov. 8: Shipments of ores and bullion are now coming in to the forwarders here from Pioche, Bristol and other points south and west of us. Notices are posted up at the Cave and Summit mines, Bradshaw district, that a reduction in miners' wages to $3 per day will commence on the first of December next. Quite a body of water has been struck in the Cave mine, and although the new pump does its work, yet more boiler capacity is needed to run the hoists and pumps. This mine continues to improve, and large bodies of ore are encountered as development goes on. Shipments of ore from the Summit mine have ceased for awhile, as the entire force of miners have been placed on work of development. This mine bids fair to rival the Cave at no distant day. Work on the Mountain Maid mine has been resumed, and is now one of the most promising claims in this district.

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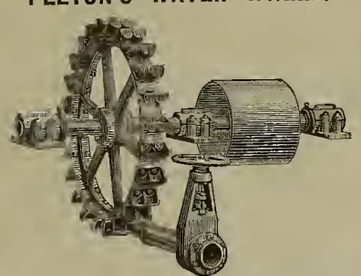

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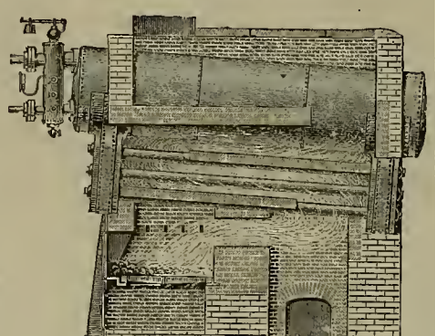

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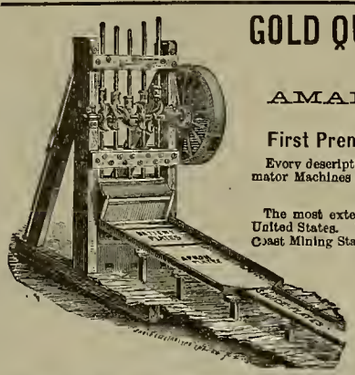

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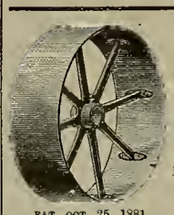

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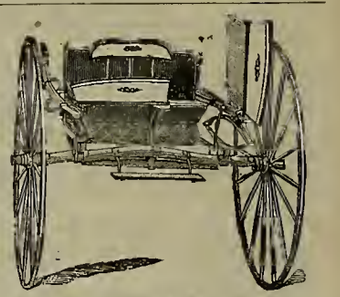

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Yours truly, P. VEASEY,
31 California St., S. F.

FINE GOLD GULCH, Nov. 10, 1883.

Mr. F. A. Huntington, San Francisco, Cal.—DEAR SIR—In reply to your inquiry concerning the working of your Centrifugal Roller Quartz Mill, I am pleased to say that I run one of them for seven months, doing custom work on different varieties of rock, and that the mill give satisfaction in every respect, and did all that you claim for it.

Yours truly, BYRON JENNINGS.

GARIBALDI MINE, Dec. 17, 1883.

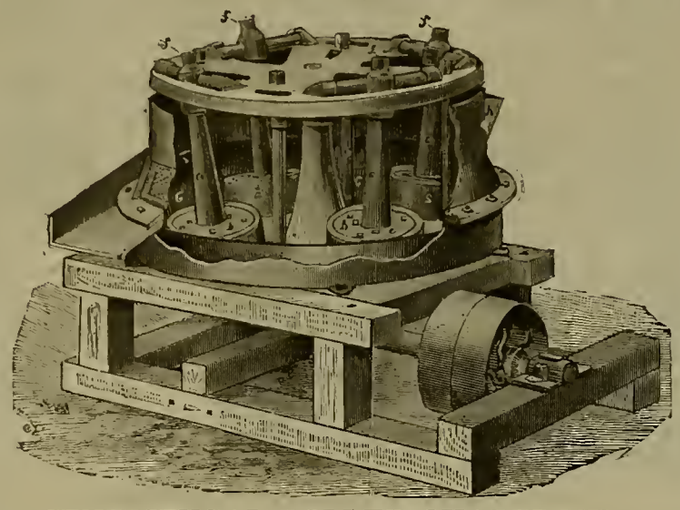
F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR—In reply to yours of the 10th inst., I take pleasure in assuring you that your Centrifugal Roller Quartz Mill gives entire satisfaction, and I can heartily recommend it to mining men who want a cheap and efficient crusher.

Yours truly, E. I. PARSONS, Supt.

32 WASHINGTON AVENUE,
SAN FRANCISCO, Dec. 29, 1883.

F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR: Having run one of your Centrifugal Roller Quartz Mills on sample lots of rock from more than twenty different mines, I must say that in every instance it has given the best of satisfaction in every particular; and I recognize its superiority over any other mill manufactured.

Very truly yours, D. O. MOWRY.



CENTRIFUGAL ROLLER QUARTZ MILL.

The work done by the Centrifugal Roller Quartz Mill, during the past two years, on various mines and different kinds of rock, PROVES ALL THAT IS CLAIMED FOR IT, viz.:

1. The cost of same capacity is not more than one-half that of stamps.
2. Freight to mine one-fourth that of stamps.
3. Cost of erection at mine one-tenth that of stamps.
4. It runs with one-third the power per ton of ore crushed.
5. The wear is less than that of stamps.
6. The wearing parts are easily duplicated.
7. It has a much better discharge, and leaves the pulp in better condition for concentrating.
8. It is a better Amalgamator, saving fully nine-tenths of the gold in the mill; the balance can be saved on plates in the usual manner.
9. It is continually crushing; not like the stamp, using power to suspend it in air ninety-nine one-hundredths of the time and the balance making a thundering noise, and accomplishing *comparatively* small results. It is as far in advance of the stamp mill as the present method of making flour with improved rolls is over the Indian's mode of crushing corn in a stone mortar.

PATTEN'S CONCENTRATOR.

This machine requires less power, less care or attention, and is less liable to get out of repair than any concentrator now in use; all of which any practical miner will comprehend when seeing it in operation.

SONORA, CAL., Dec. 1, 1883.

F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR:—In reply to yours of recent date, inquiring about the Centrifugal Mill which I bought of you, I will say that I have run the mill four months on hard rock; and I take pleasure in adding that the mill has in every way given the best of satisfaction.

Yours truly, J. H. NEALE.

GARIBALDI MINE,
Calaveras Co., Cal., Dec. 17, 1883.

F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR:—In answer to your inquiry concerning the working of the five feet Centrifugal Mill, bought of you for the Garibaldi mine in Calaveras county, I take pleasure in saying it gives entire satisfaction in every respect, and I only regret that the mine does not warrant the purchase of more of them and the continued use of the one now in operation.

Very truly yours, O. B. SMITH.

F. A. Huntington Esq., San Francisco, Cal.—DEAR SIR—Your Centrifugal Roller Quartz Mill has run on the Whidden Gold Mining Co. property at Shingle Springs, El Dorado Co., Cal., about four months, and it has done good and satisfactory work, a greater proportion of gold remaining in the mill than in the stamp battery. FRED JONES, Supt.

HILDRETH RANCH, Fresno Co., Cal.,
January 11, 1884.

F. A. Huntington, Esq., San Francisco, Cal.—DEAR SIR—In regard to your mill (Centrifugal Roller), I have crushed about 500 tons of rock in the mill, and am glad to say that it has given entire satisfaction, and can recommend it to the public as the most expeditious and least expensive method for crushing and milling ore that I have ever seen. Truly yours,

THOS. HILDRETH.

MILLS ERECTED WITH ALL APPLIANCES COMPLETE. CAPACITY AND DURABILITY GUARANTEED

F. A. HUNTINGTON, 45 Fremont St., San Francisco.

☞ SAMPLE LOTS OF ORE WORKED. ☜ ☞ WHERE A MACHINE CAN BE SEEN IN OPERATION. ☜

Metallurgy and Ores.

JOHN TAYLOR & CO.,

IMPORTERS AND DEALERS IN

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CHEMICAL APPARATUS AND CHEMICALS, DRUGGISTS' GLASSWARE AND SUNDRIES, ETC.

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We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price. Our New Illustrated Catalogue, with prices, will be sent on application.

☞ Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application. Agents for the Patent Plumbago Crucible Co., London, England.

JOHN TAYLOR & CO.

Nevada Metallurgical Works.

NO. 23 STEVENSON STREET,
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A. LUCKHARDT, Manager. ESTABLISHED 1869.

Ores worked by any Process.
Ores Sampled.
Assaying in all its Branches.
Analyses of Ores, Minerals, Waters, etc.
Working Tests (practical) Made.
Plans and Specifications furnished for the most suitable Process for Working Ores.
Special attention paid to Examinations of Mines; Plans and Reports furnished.

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(Formerly Huhn & Luckhardt),
Mining Engineers and Metallurgiste.

THOMAS PRICE,

Chemical Laboratory, Assay Office,

BULLION ROOMS & ORE FLOORS,
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SAN FRANCISCO, CALIFORNIA.

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MANUFACTURERS OF

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HERCULES POWDER

HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

No. 1 (XX) is the Strongest Explosive Known.
No. 2 is superior to any powder of that grade.

PATENTED IN THE UNITED STATES PATENT OFFICE.

ORDERS RECEIVED FOR HERCULES CAPS AND FUSE.

JOHN F. LOHSE, SEC'Y.

Office, No. 230 California Street - - San Francisco, Cal.

THE CONSUMERS' COMPANY.

VULCAN B B AND AJAX.

The Best LOW GRADE EXPLOSIVES in the Market.

☞ SUPERIOR TO BLACK OR JUDSON POWDER. ☜

Vulcan Nos. 1, 2 and 3,

The Best NITRO-GLYCERINE POWDERS Manufactured.

SPECIAL INDUCEMENTS IN PRICES.

AJAX and VULCAN B B POWDERS are Unequaled for Bank Blasting and Railroad Work.

Caps and Fuse of all Grades at Bottom Rates.

VULCAN POWDER CO.,

218 California Street, San Francisco, Cal.

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GOLD, SILVER and LEAD

IN THEIR VARIOUS FORMS.

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Assaying and Analysis of Ores, Minerals and Waters.
Mines Examined and Reported on.
Practical Instruction given in Treating Ores by approved processes.

G. KUSTEL & CO.,
Mining Engineers and Metallurgists.

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574 Folsom Street, N. E. Cor. Second, S. F.

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Sunny Suites and Single Rooms with or without Board at reasonable rates. Hot and Cold Water. Folsom street cars pass the door. Location and Appointments unexcelled in San Francisco.

Mining Share Market.

The election excitement, which has lasted so much longer than expected, has had a bad effect on the market for mining shares which has been almost entirely neglected. The leading mines at Gold Hill are still sending sufficient ore to the Carson river to keep all the mills running to their full capacity. At the north end no crosscutting has yet been done. They are feeling their way at the 3300 station of the deep winze. A diamond drill hole has been run west on the 3300 level a distance of over 300 feet in dry ground, when a wet streak was reached. The drill is now being run south from the same station. The level bids fair to be a rather wet one. At the Hale and Norcross they are almost down to the 3000 level with their main winze. In passing, they cut out a working station at the 2900 level. All is now in shape for doing some very interesting prospecting work. Both the Gould and Curry and the Best and Belcher are running crosscuts west on the 825 level. They have on this level and above, to the very surface, a vast area of unexplored ground.

The following companies had on hand the amounts set opposite their names on the 1st inst.: Alta, $24,369.19; Andes, 8,040.45; Alpha Con., 9,289.49; Bulwer, 3,604.76; Best and Belcher, 13,502.09; Benton Con., 16,248.89; Bodie Con., 75,112.95; Belcher, 16,138.38; Crown Point, 24,261.97; Chollar, 6,243.38; Con. California and Virginia, 15,065.29; Exchequer, 6,574.93; Gould and Curry, 13,453.50; Martin White, 6,760.85; Mono, 23,767.11; Mexican, 10,288.47; Occidental, 3,029.03; Potosi, 24,964.41; Sierra Nevada, 18,050.12; Savage, 32,833.03; Summit, 312.38; Tioga Con., 870.83.

The following companies had indebtedness on the 1st inst.: Argenta, $131.16; Grand Prize, 42,735.35; Hale & Norcross, 19,130.10; Lady Washington Con., 3,457.89; Ophir, 6,853.26: Standard, 4,869.39.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, department 10, San Francisco:

SPERRY ELECTRIC LIGHT CO., Nov. 10. Capital stock, $1,000,000. Directors, Robert Sherwood (President), F. P. Hooper (Vice-President), S. D. Hoag (Secretary), Edward W. Hopkins (Treasurer), Edwin Goodall, Livingston Gibson and Samuel C. Bigelow.

STOCKTON GAS LIGHT AND HEAT CO., Nov. 11. Object, to engage in the sale and manufacture of gas heat, electricity and steam power. Capital, $250,000. Directors, Edward Barry, George W. Haight, Sylvester Hemenway, Alfred T. Eastland and F. R. Colton. The principal place of business will be in San Francisco.

CRYSTAL MINING CO., Nov. 11. Location, El Dorado Co., Cal. Capital stock, $1,000,000. Directors, W. W. Walker, A. B. Hull, Chas. H. Fish, W. C. Stadfeld, A. K. Durbrow.

NESTOR M. CO., Nov. 11. Capital stock, $100,000. Directors, Edmund Green, Mack Shepard, E. F. Green, P. F. Kraner and I. M. Merrill.

PETROLEUM FUEL CO., Nov. 11. Capital stock, $1,000,000. Directors, John F. Miller, Patrick Noble, A. C. Miller, Mack Webber and I. C. Miller.

MERIDIAN BORAX CO., Nov. 11. Objects, to buy, sell, lease, bond and own mines, mineral lands, real estate, etc.; also to mine and refine minerals. Capital stock, $5,000,000. Directors, Thomas W. Chinn, of Oakland, W. C. Brown, John F. O'Brien, George Renner and William M. Brison.

SULKY HARROW MANUFACTURING CO., Nov. 12. Capital stock, $100,000. Directors, I. J. Harvey, H. G. Richmond, Eugene Soule, C. R. Smith and J. H. Maholm.

Bullion Shipments.

King, Nov. 9, $19,896; Silver Odessa, 4, $7,804; Hanauer, 4, $5,600; Crescent, 4, $3,300; Idaho ore, 4, $2,200; Ontario, 4, $3,733; Horn Silver, 4, $12,000; Christy, 4, $3,690; Vienna, 4, $5,752; Hanauer, 5, $18,000; Crescent, 5, $2,460; Day, 7, $4,461; Hanauer, 7, $3,500; Horn Silver, 7, $3,000; Christy, 7, $4,200; Vienna, 8, $1,552; Idaho ore, 8, $1,380; Hanauer, 8, $5,500; Queen of the Hills, 8, $1,300; Crescent, 9, $1,900; Idaho ore, 9, $2,900; Horn Silver, 9, $12,000; Ontario, 9, $15,855; Navajo, 11, $14,000; Bodie Con., 9, $43,860; Christy, 11, $4,047; Grand Prize, 6, $6,000; Standard, 13, $5,052; Paradise Valley, 11, $4,536.

Our Agente.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
J. J. BARTELL—Sacramento County.
A. C. KNOX—Nevada State).
GEO. MCDOWELL—Alameda and Santa Clara Counties.
WM. PARCOR—San Francisco.
WM. H. COOK—Los Angeles County.
H. G. PARSONS—Montana and Idaho.
G. W. INGALLS—Arizona.
D. K. BRAMBLE—Humboldt and Del Norte Counties.
W. WHITWELL—Oregon.

THE total Lake Superior copper ore shipment, up to the 1st inst., for the year aggregates 2,303,737 tons, this being but 47,055 tons short of the entire output for the season of 1883.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M & M Co	Alaska	8	70	Oct 14	Nov 15	Dec 5	E F Stone	306 Pine st
Andes M Co	Nevada	25	25	Sept 23	Oct 23	Nov 20	E Burris	309 Montgomery st
Butte Creek Hyd M Co	California	10	10	Sept 23	Nov 6	Nov 29	R L Taylor	230 Montgomery st
Caborca M Co	Mexico	9	03	July 18	Nov 1	Dec 1	C Bone	328 Montgomery st
Chollar M Co	Nevada	15	50	Oct 29	Dec 2	Dec 23	G L McCoy	349 Montgomery st
Con Va & California M Co	Nevada	1		Nov 5	Dec 13	Jan 3	A W Havens	308 Montgomery st
Crocker M Co	Arizona	1		Oct 31	Dec 2	Dec 23	A Waterman	309 Montgomery st
Daisy Cement M Co	California	2	02	Sept 26	Nov 8	Nov 29	C J Collins	512 Montgomery st
Day S M Co	Nevada	15	75	Sept 26	Nov 3	Dec 2	E M Hall	327 Pine st
Gould & Curry S M Co	Nevada	49	50	Oct 25	Nov 29	Dec 22	A K Durbrow	309 Montgomery st
Golden Fleece G M Co	California	34	40	00	Oct 13	Nov 18	F Schirmeier	412 Sixth st
Lamphire G M & M Co	California	1	10	Oct 3	Nov 17	Dec 8	A Martin	526 Montgomery st
Marshall M Co	California	2	10	Nov 6	Dec 15	Jan 5	A L Perkins	310 Pine st
Mexican G M Co	Nevada	28	50	Nov 11	Dec 17	Jan 8	C E Elliott	309 Montgomery st
Ophir M Co	Nevada	48	50	Nov 12	Dec 17	Jan 6	E B Holmes	309 Montgomery st
Peerless M Co	Arizona	2	25	Sept 25	Nov 3	Nov 29	A Waterman	309 Montgomery st
Rainbow M Co	California	12	15	Oct 24	Dec 1	Dec 29	F Marhardt	311 Montgomery st
Richard M Co	California	1	25	Oct 17	Dec 1	Jan 5	W Willis	309 Montgomery st
Sierra Nevada S M Co	Nevada	80	50	Oct 22	Nov 26	Dec 25	E L Parker	309 Montgomery st
Sterling M Co	California	1	05	Sept 18	Oct 23	Nov 20	W H Allen	306 Pine st
Savage M Co	Nevada	61	50	Nov 11	Dec 15	Jan 5	E B Holmes	309 Montgomery st
Utah S M Co	Nevada	51	50	Oct 23	Nov 28	Dec 16	G C Pratt	309 Montgomery st
Union Con M Co	Nevada	28	50	Nov 5	Dec 9	Dec 30	J M Buffington	309 California st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Butte Creek Hyd M Co	California	R L Taylor	230 Montgomery st	Annual	Dec 1
Chicago Con M Co	Nevada	John Nuttall	608 Montgomery st	Annual	Nov 24
Challenge Con M Co	California	C L McCoy	309 Montgomery st	Annual	Nov 20
Cueva Santa M Co	Mexico	W Letts Oliver	328 Montgomery st	Annual	Nov 25
Kentuck M Co	Nevada	J W Pew	310 Pine st	Annual	Nov 26
North Gould & Curry M Co	Nevada	C H Mason	331 Montgomery st	Annual	Nov 20
Summit M Co	Nevada	G W Sessions	309 Montgomery st	Annual	Nov 17
Tobogo M Co		J L Fulda	330 Pine st	Annual	Nov 18
Peck M Co	Arizona	C T Bridge	224 California st	Annual	Nov 20

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Oct 8
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Nov 13
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Oct 29
Silver King M Co	Arizona	J Nash		25	Nov 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Nov 6

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication in this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.]

DATE. Nov. 6-12	Portland. Rain	Temp.	Wind	Weather	Red Bluff. Rain	Temp.	Wind	Weather	Sacramento. Rain	Temp.	Wind	Weather	S. Francisco. Rain	Temp.	Wind	Weather	Los Angeles. Rain	Temp.	Wind	Weather	San Diego. Rain	Temp.	Wind	Weather
Thursday	.01	56	E	Cy.	.00	66	SE	Cl.	.00	69	SW	Cl.	.00	56	W	Fy.	.00	87	S	Cl.	.00	73	W	Cl.
Friday	.14	54	SW	Cl.	.00	67	N	Cl.	.00	64	SW	Fr.	.00	60	E	Fr	.00	81	W	Fr.	.00	72	W	Cl.
Saturday	.00	57	SW	Cy.	.00	64	SW	Cy.	.00	67	S	Cl.	.00	58	SW	Cy.	.00	69	SW	Cl.	.00	66	W	Cl.
Sunday	.17	60	S	Cy.	.00	62	SW	Cy.	.00	64	SW	Fr.	.07	62	S	Cy.	.00	68	S	Cl.	.00	65	W	Cl.
Monday	.02	59	E	Cy.	.00	66	S	Cy.	.00	66	SE	Cl.	.00	60	E	Cy.	.00	67	SW	Cl.	.00	64	W	Cl.
Tuesday	.01	57	N	Cl.	.00	66	N	Fr.	.00	62	N	Fr.	.00	66	SE	Cy.	.00	71	W	Fr.	.00	72	W	Cl
Wednesday	.00	59	E	Cl.	.00	62	E	Cy.	.00	66	S	Cy.	.16	58	SE	Cy.	.00	68	S	Fr.	.00	68	S	Cl.
Totals	.35				.00				.00				.23				.00				.00			

EXPLANATION.—Cl, for clear; Cy., cloudy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature wind and weather at 11:55 A. M. (San Francisco mean time), with amount of rainfall in the preceding 24 hours

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 23.		WEEK ENDING Oct. 30.		WEEK ENDING Nov. 6.		WEEK ENDING Nov. 13.	
Alpha	1.25	1.40	1.15	1.45	.70	1.10	.95	1.00
Alta	1.60	1.90	1.60	1.75	.85	1.35	.75	1.20
Andes	.05	.10	.05	.35		.30		.30
Argenta						.05		
Belcher	.85	.85	.75	.60	.70	.70	1.45	
Belding								
Best & Belcher	1.50	1.80	1.70	1.90	1.50	1.70	1.30	1.70
Bullion	.30	.35		.27		.20		.25
Bonanza King								
Belle Isle	.35	.55	.45	.50		.50		.55
Bodie Con	2.10	3.05	2.70	2.80	2.05	2.75	2.45	3.00
Benton	.50	.55		.45	.25	.35	.20	.30
Bodie Tunnel								
Bulwer	.55	.80	.65	.75	.35	.55	.55	.60
California	.35	.55		.45	.25	.40	.15	.30
Challenge	.20	.25				.15		
Champion			.30	.40		.30		
Chollar	2.00	2.50	2.30	2.50	1.95	2.25	2.10	2.35
Confidence						.80		.70
Con. Imperial								
Con. Virginia	.35	.40		.45	.25	.40	.15	.30
Con. Pacific		.85	.85	.90		.90		.95
Crown Point	1.35	1.45		1.40	.90	1.25	1.00	1.05
Day								.75
Eureka Con	2.10	2.75		3.80		2.95		3.00
Eureka Tunnel								
Exchequer	.10	.35	.20	.25	.05	.20		.15
Grand Prize	.25	1.25		.15	.15	.20	.10	.15
Gould & Curry	1.00	1.25	1.10	1.30	.95	1.10	.90	1.00
Goodshaw								
Hale & Norcross	2.70	3.30	3.10	3.20	3.10	3.25	2.85	4.00
Holmes	3.00	3.25			3.40	3.50		
Independence								
Julia								
Justice	.20	.25				.15		.15
Martin White		.40	.40	.45		.40		
Mono	1.50	2.00	1.60	1.70	1.10	1.55	1.30	1.55
Mexican	.90	1.20	1.00	1.15	.90	1.00	.85	1.00
Mt. Diablo	3.40	3.75		3.60	3.50	3.80	3.50	3.75
Northern Belle								
Navajo	3.85	3.95	3.80	3.90	3.75	3.80	3.75	3.95
North Belle Isle	.50	.60	.45	.50		.45		.45
Occidental	1.35	1.50	1.45	1.50			1.25	1.50
Ophir	.75	.85	.80	.90	.75	1.00	.60	.85
Overman	.15	.20	.15	.20	.15	.20		
Potosi	1.05	1.30	1.20	1.30	1.00	1.15	.90	1.15
Pinal Con								
Savage	1.25	1.40	1.35	1.40	1.25	1.35	.95	1.45
Seg. Belcher		1.00						
Sierra Nevada	.85	1.25	.95	1.10	.80	1.00	.60	1.00
Silver Hill				.65				
Silver King		4.15		4.15		4.05		1.13
Scorpion	.15	.60	.14	.15		.15		.45
Syndicate	.60	.65		.55	.50	.55	.45	.55
Tioga								
Union Con	.80	1.10	.80	.99	.75	.90	.55	.90
Utah	.60	.90	.60	.80	.55	.60	.45	.55
Yellow Jacket	1.70	1.85	1.80	1.85	1.80	1.80	1.50	1.75

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Nov. 13.		AFTERNOON SESSION.	
500 Alta	.75c	1250 Alta	1.15@1.20
30 Alpha	.91c	20 Bodie Con	2.80
150 Bodie	2.90	350 Bulwer	.55c
460 B & Belcher	1.30	150 Benton	.30c
750 Benton Con	.35@.39c	200 B. & Belcher	.75@1.35
30 Con. Pacific	.95c	450 Con Va & Cal	.30c
440 Chollar	1.80@1.85	450 Chollar	2.30@1.35
65 Con Va & Cal	.15c	70 Crown Point	1.00@1.05
50 Confidence	.50c	130 Gould & Curry	1.10
300 Crown Point	.80c	500 Hale & Nor	2.65@2.70
50 Exchequer	1.00	20 Mexican	1.00
515 Gould & Curry	.70@.75c	20 Mono	1.30
300 Hale & Nor	2.70	370 Navajo	3.75@3.85
250 Mexican	.65c	745 N. Belle Is	.45c
100 Navajo	3.55	300 Ophir	.55c
425 Ophir	.55c	30 Occidental	1.45
100 Occidental	1.00	125 Potosi	.95c
70 Potosi	.90@.95c	50 Syndicate	.55c
395 Sierra Nevada	.55@.60	200 Scorpion	.25c
550 Savage	.85@.90c	200 Sierra Nevada	.55c
130 Union Con	.55c	400 Savage	.85c
50 Utah	.60c	100 Union	.55c
30 Yellow Jacket	1.50	100 Yellow Jacket	1.70

San Francisco Metal Market.

[WHOLESALE, THURSDAY, Nov. 13, 1884.

ANTIMONY—Per pound		—
Hallet's	13 @	—
Cookson's	14 @	—
BORAX—Refined	7½@	8
IRON—Glengarnock ton	25 00 @	—
Eglinton, ton	24 00 @	—
American Soft, ton	25 50 @	—
Oregon Pig, ton	@	—
Clipper Cap, Nos. 1 to 4	30 00 @32	50
Clay Lane White	22 00 @	—
Shotts, No. 1	26 00 @	—
Refined Bar	3 @	5½
Boiler, 1 to 4	5 00 @	5 50
Plate, 5 to 10	4½@	4½
Nail Rod	7 @	—
Norway, according to thickness	6 @	7
STEEL—English, lb	16 @	25
Black Diamond, ordinary sizes	13 @	—
Drill	15 @	—
Machinery	12 @	14
COPPER—Ingot	14 @	15
Braziers' sizes	7 @	37
Fire-box sheets	28 @	—
Bolt	23 @	25
Bar	@	—
Cement, 100 fine	12 @	—
Copper in New York, Nov. 12	12½@	—
LEAD—Pig	3½@	4
Bar	5½@	—
Pipe	7 @	—
Sheet	8 @	—
Shot, discount 10% on 500 lbs: Drop, ₱ bag	1 85 @	—
Buck, ₱ bag	2 05 @	—
Chilled, do	2 25 @	—
ZINC—German	9 @	—
Sheet, 7x3 ft, 7 to 10 lb, less the cask	9 @	10
QUICKSILVER—By the flask	30 00 @	—
Flasks, new	1 05 @	—
Flasks, old	85 @	—

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & CO.'S SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING NOVEMBER 4, 1884.

307,435.—HOISTING APPARATUS FOR THRASHING MACHINES—Jas. H. Carlile, Tulare, Cal.

307,532.—VINE PLANTER—Jos. D. Enas, Napa.

307,550.—BORING MACHINE—G. A. Jackson, Oakland.

307,551.—STAIRS—P. H. Jackson, S. F.

307,560.—ORE CONCENTRATOR—Geo. H. Malter, S. F.

307,687.—HOOK AND EYE—Harriet W. R. Strong, Oakland.

307,510.—VEHICLE GEAR—E. Whitmore, S. F.

Patents Allowed.

Among patents recently allowed, and not yet announced, we are at liberty to mention the following which will soon issue:

CYLINDER TEETH—John Christian, San Jose, Cal.
MITRE BOX—Paul Castrin, S. F.
FRUIT PICKER—H. W. Folsom, S. F.
FIRE KINDLER—C. Leduc, S. F.
FIRE KINDLER—B. W. Connolly, S. F.
ORE CONCENTRATOR—Otto Hanson, Sacramento.
DRILL—Thos. M. Yeskes, S. F.
HOSE REEL—Harding & Hill, S. F.
GARMENT FASTENER—A. W. Smith, S. F.
EMBROIDERY FRAME—Izora Elder, S. F.
BRUSH—B. Normandin, S. F.
SPUR—Johan Kaino, Cuffeys Cove.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise), at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

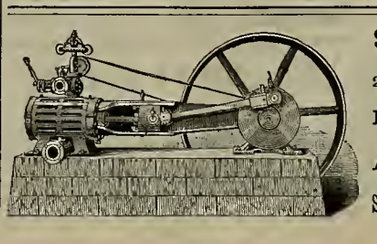
Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

TWO-WHEELED VEHICLE.—John A. Bilz, Pleasanton, Alameda Co. No. 307,168. Dated October 28, 1884. The improvements covered by this patent consist in the arrangement of spring-supports for the body, in a novel means of supporting the body from the spring, and in a peculiar device for leveling the body.

LINE INDICATOR FOR TYPE WRITERS.—Edwin S. Belden, S. F. No. 307,164. Dated October 28, 1884. In the operation of type writing and similar machines, it is customary to indicate when the end of a line has been reached by a small gong or bell, which is struck by suitable means. Mr. Belden's improvement consists in a peculiar combination and arrangement of devices. A pawl-carrying lever is operated by the carriage when returned from the end of the line, and by a peculiar system of ratchet wheel, pawl, piston and gear wheel, the bell hammer is operated.

LINING FOR CHIMNEYS.—Jeremiah Browell, S. F. No. 302,173. Dated October 28, 1884. This lining or protection for the interior of flues in chimneys consists of a coat of black-lead, either applied separately or mixed, so as to produce a smooth surface within the flue. A better draft is thus provided, and the surface is of such a character that particles of soot will not adhere.

APPARATUS FOR MAKING EXPLOSIVE COMPOUNDS.—O. B. Hardy, S. F., assignor of one-half to Giant Powder Company. No. 306,920. Dated Oct. 21, 1884. This is an improved apparatus which is used in the manufacture of explosive compounds, these improvements relating more especially to the drying apparatus, which is used after the mixing has been completed. The apparatus is for granulating and drying the pasty mass made in the mixer, and consists of a shaking screen or sieve having a plain bottom, through which the mass is passed, and an endless apron below said screen, adapted to receive the grains as formed and to elevate them to and discharge them upon the first of the series of traveling belts, arranged in a peculiar way, whereby the grains are deposited upon the other and transported throughout the whole series of belts, and thus agitated until dry. By the peculiar construction of a shaking screen for granulating the pasty mass from the mixer and discharging it directly upon the traveling belts, it is not necessary to handle it until the operation is entirely completed, and the grains, being kept in motion and dropped periodically from one belt to another, are prevented from adhering before they become dry.



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And Heavy Saw-mill Machinery.
....SOLE AGENTS FOR THE....
Skinner & Wood Portable Engines and Boilers

Park City, Utah.

(Continued from page 309.)

cause its machinery to start during the season of '85. For a time the mill was leased by the Ontario Company. Everything now points to the fact that the Crescent will soon be a dividend-paying mine, na its henvy expensea are about completed.

The Sampson Mine

Ranks next to the Crescent in the matter of present activity. It lies on the eastern slope of the hill, in which are located the Crescent properties. It is a comparatively new miue, or one in which developments of great extent have not been made. But the work of taking out ore and prospecting is now being pushed with more than usual vigor, under the superintendence of H. A. Van Praag, Esq. At present the pay ore comes from the 65 foot level. A drift has just been run from a lower level, and has penetrated the lodge in good ore, so that we may horeafter look for a larger output from the Sampaon. The product haa been about 20 tons per week, of a high-grade galena ore, running 35 per cent lead, with 100 ozs. silvor to the ton. This high quality of ore is scattered through the vein, which is itself 20 feet wide. Much ore of a lower grade than that just described is now lying on the dumps at the mine, which can be mnde valuable by concentration. The ore goes to Salt Lake for reduction. About 40 men are employed in and about the mine. There is certainly a hopeful outlook for the Sampson.

The Uintah Mining Co. is under the aame management as the Sampson. It liea west of the Crescent propertics. Very little work has been done upon the location, hut the value of Crescent ores suggests a valuable quality for the ores of its nenrest neighbor. When the Sampson is more fully developed, the company will probably pay more attention to the Uintah.

Other Mines and Matters.

We have now mentioned the principal ore-producing mines of the Park City region. There are numberless locations upon the many hills of the neighborhood, but we did not learn of many which could yet be ranked as productive mines. The Empire, lying between the Ontario and the Sampson, nnd the Daly tunnel are of great prospective value. The Empire has sunk a shaft to the depth of 500 feet, but we helieve work has been abandoned for the present. At the Daly trnnel a considerahle force of men are now at work, with every encouragemcnt that there is a large ore body ahead. It is assumed, but not yet demonatrated, that the same kind of ore will be found as is taken from the Ontario. Other locations are in state of development, and in time we may look for a large number of productive mines near the Park.

The Mackintosh sampling mill, under the management of Truman Schenck, superintendent, is one of the standard properties of Park City. It is located near the railroad depot, and has all the work it can possihly attend to. The mill samples 100 to 50 ton lots, for which they employ 10 to 12 men. This institution is n valuable aid to the development of mines in the locality. The Sampson and the Crescent have much work done here.

Park City seems to be a more orderly mining town than other places of its size in mining regions. There is little ruffianism, and the business methods of the city are quiet and sensihle. The merchanta complain a little of dull times, hut hnsiness is more satisfactory than it is in the rural towns of Utah, where the low price of grain and produce almost paralyzes trade.

We cannot closa our sketch of Park City without a few words concerning the Park City Hotel kept by "Mine Host," Mr. F. Fischel, assisted by his amiahle wife. Mr. Fischel attends closely to the wishes of his patrons, and furnishes a tahle which would do credit to a hotel in a metropolitan city. We heartily enjoyed our sojourn at "The Park," and friend Fischel contrihuted his share toward that enjoyment, as he will in the case of all who may come within his hospitable doors.

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Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of this subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

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GENERAL OFFICE AND WORKS: Fulton and Union Streets, Chicago, Ill.
NEW YORK OFFICE: Room 43, No. 2 Wall Street.
WAREHOUSE AND BRANCH OFFICE: No. 423 Blake Street, Denver, Colorado.
MEXICO OFFICE: No. 11 Calle de Juarez, Chihuahua, Mexico.

Incrustation of Steam Boilers.

As compared with its importance, this subject ia one which has received but little attention until recently. Those minor details of management which form the foundation of safety in all employments and enterprises, are apt to be more or less neglected. In no case is this probably so trne as in the management of ateam generators. Men who have not had the proper technical training for such trusts nre often placed in full control, with carte-hlanche to do as tbey please with the boilers, provided they promptly furnish the necessary steam for the engine. Expensive compounds are often purchased and recklessly employed, which yield only unsatisfactory results. Many persons believe rather in mechanical devices than chemical compounds for preventing incrustation, although there are many of the latter on the market which are highly recommended by those who have used them.

A little volume has just been issned by the Industrial Puhlishing Company, 1114 Pennsylvania avenue, Washington, which is a treatise on the subject of steam hoiler incrnstation and methods of preventing corrosion, and the formation of scale. It is from the pen of Charles T. Davis. The work is illustrated, and comprises about 140 pages. It describes the various compounds, and the mechanical appliances for preventing scale in boilers, and shows the state of the art at the present time.

In addition to the various chapters descriptive of the compounds, etc., there is given a full list of all U. S. patents, with dates, nnmhers, etc., of compositions for preventing and loosening incrustations, and mechanical appliances for the same purpose. After the chapter containing the general remarks on the snhject, is one on determination of constituents and hardness of water, purifying water for hoilers, compounds, appliances, etc. The work is useful to all steam users, as it gives in a compact form all the available information on the snhject. In addition to fixed mechanical and electrical devices, no less than 170 different kinds of materials have been placed in steam boilers to retain the mineral particles in solution, or to prevent their adhcrence to the boiler. A list of these is given.

ONE OUT OF A HUNDRED HEARD FROM.—C. Muller, 135 Montgomery street, desires to inform our readers that he is not the optician interviewed by the *Chronicle* reporter, issue of February 12th, as he does not claim as his own, nor require Berringer's Patent Optometer, Rochester, New York, or any other as his own invention. There are many pretenders and would-be opticions, but very few frank enough to confess it. Some opticians claim exclusivo mechanical facilities for suiting the eye, and acknowledging their utter incompetency when pathological difficulties present themselves. No swindling or make-believe pretensions resorted to at my establishment. Physieal and Physiological Optics are my daily study. With over thirty years practical experience, I can confidently solicit all who have eye difficulties to avail themselves of my professional service free of charge. C. MULLER, Optician, 135 Montgomery street, San Francisco. x

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S. F. VISITOR'S DIRECTORY.

For the convenient reference of our readers, and benefit of visitors to S. F. from the interior and abroad, we shall occasionally insert the following directory free. Officers of associations mentioned ure invited to notify us promptly of any changes occurring from time to time.

California Academy of Sciences.

Hall and museum, S. W. corner California and Dupont Presidcnt, PROF. GEORGE DAVIDSON; Secretary, CHARLES G. YALE. Regular meetings, 1st and 3d Mondays of each month. Museum open to the public from 9 A. M. to 5 P. M. on Mondays, Wednesdays and Saturdays. Museum embraces all classes of natural history speciuens.

Crocker-Stanford Collection

This collection was presented to the California Academy of Sciences by Charles Crocker nud Leland Stanford. It comprises a large number of specimens of minerals, casts and articles fn all branches of natnral history. Among other things are many of Ward's casts, including the monster elephants, mammals, etc. The collection is on exhibition at Mercantile Library Hall, 214 Bush St., and is open to the public every Saturday from 10 A. M. to 9 P. M. Chas. D. Gibbes, curator.

California Pharmaceutical Society.

Lectures are given at the hall of the College of Pharmacy Fulton street, between Polk and Van Ness avenue, three nights each week, for a term of six months, in the summer.

California State Geological Society.

Henry G. Hanks, President; S. Heydenfeldt, Jr., Secretary. Headquarters, State Mining Bureau, 212 Sutter St.

Geographical Society of the Pacific.

Rooms, 413 Sutter St. President, George Davidson; Secretary, C. Mitchell Grant. Meetings, 1st and 3d Tuesdays of each month.

California State Mining Bureau.

Office and museum, 212 Suttor St. State Mineralogist, Henry G. Hanks. Open daily to visitors free, from 10 A. M. to 3 P. M. Museum comprises ores, minerals, rocks and natural products of the State.

Mechanics' Institute.

Rooms and library, 31 Post St. P. B. Cornwall, President; W. P. Stout, Recording Secretary; Horace Wilson, Librarian.

Peoples' Free Library.

Location, north side of Bush, between Kearny and Dupont. Librarian, Fred. B. Perkins. Open from 9 A. M. to 9 P. M.

Mercantile Library Association.

Library, 214-218 Bush. A. E Whitaker, Librarian. There are 52,030 volumes in the library. Reading room, with papers and magazines.

Technical Society of the Pacific Coast.

Hall, 413 St. President, Col. Geo. H. Mendell, U. S. A.; Secretary, Charles G. Yale. Regular meeting, first Friday of each month; extra meeting for discussion of papers, last Friday of each month.

Society of California Pioneers.

Rooms, 808 Montgomery St. President, Nathaniel Holland; Secretary, F. Vassault. There is a library cabinet of minerals, relics of early times, and other objects of interest at the rooms. Regular meetings, first Monday of each month.

San Francisco Microscopical Society.

Rooms, 120 Sutter St. President, C. Mason Kinne; Secretary, E. J. Wickson. Meetings, second and fourth Wednesdays of each month.

University of California.

Location, Berkeley. Museum comprises the collection of the State Geographical Survey, the Pioche and Keene collections, and a large miscellaneous collection of the woods, ores, minerals, rocks, etc., of the Pacific Coast.

Golden Gate Park.

The Park may be reached directly by cable cars of the Haight St. or McAllister St. line, which run out Market and branch off at the streets named, for the Park, or by the Geary St. line. The Park is opened for visitors at all times.

Woodward's Gardens.

Mission St., between 13th and 14th. Reached by Folsom, Mission, Howard and Market St. cars. In the gardens are menagerie, museum, art gallery, aviary, acquarium, theatre, restaurant etc.

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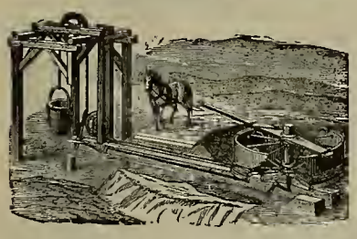

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DEWEY & CO.'S
Scientific Press

Patent Agency.
[ESTABLISHED 1860.]
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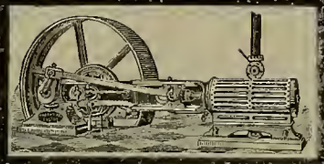
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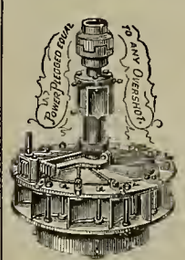

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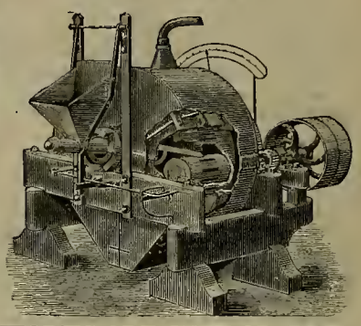
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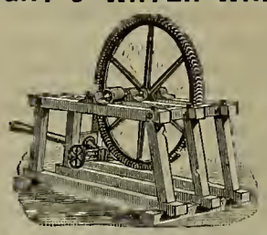
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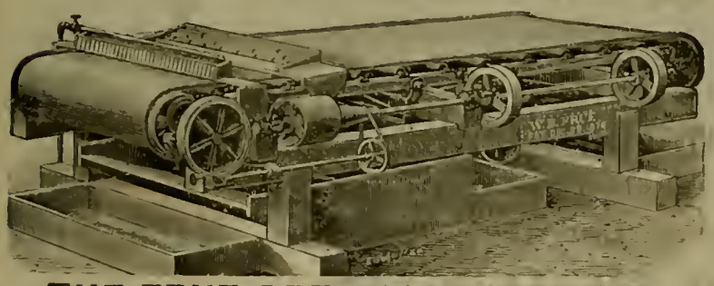

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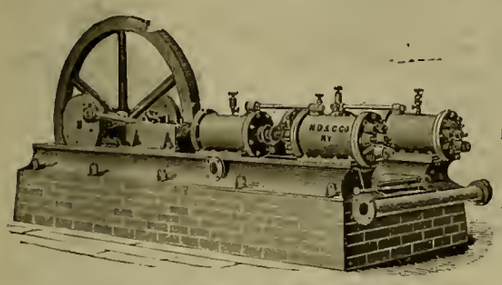

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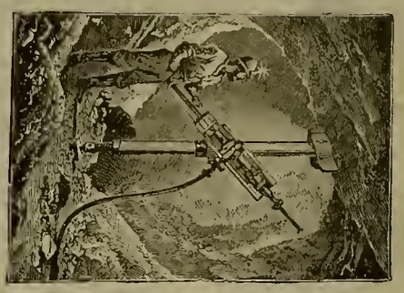

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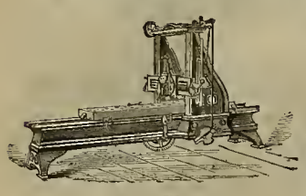
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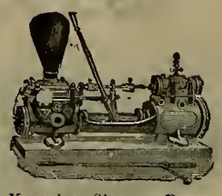
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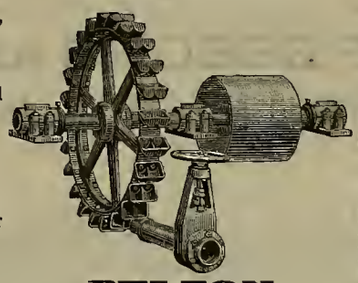
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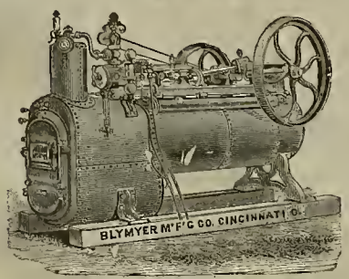

Each engine is fitted with a governor, steam and water gauges, heater, flue brush, waste and blow-off cocks, brass whistle, smoke stack with spark arrester, oil cups, gauge cocks, combination check and stop valve, and pump.
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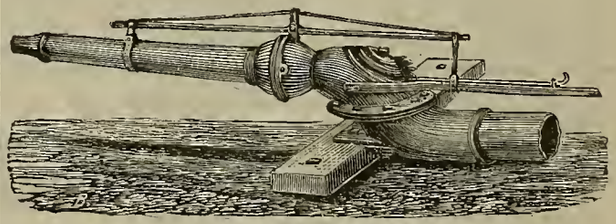

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An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, NOVEMBER 22, 1884.

VOLUME XLIX. Number 21.

The Spence Automatic Desulphurizing Furnace.

Among the persistent experimenters of the present century, no one man is more widely and favorably known in the metallurgical world than the late Peter Spence of Manchester, England, to whom we are indebted for many of the successful processes in the manufacture of acids and alkalies, and for much of that perfection in mechanical detail which goes so far towards insuring success. For the past twenty-five years—a period covering the greatest changes in soda processes and a revolution in acid-manufactures effected by the substitution of pyrites for brimstone—Mr. Spence was constantly engaged in perfecting the plant for the economical treatment of pyritous ores; and no text-book has been complete without reference to his many inventions, patented or otherwise.

The results of his labors for the past six years were not given to the public, by reason of the active competition existing among manufacturers on the continent of Europe and in Great Britain; but it was well known and conceded that the crowning triumph of his life had been achieved in the successful working of his automatic desulphurizing furnace which mechanically calcined "smalls" or finely crushed pyrites—the bugbear of all chemical manufacturers.

That he was met by many delays and disappointments, and that many difficulties were overcome by him personally, goes without saying, when we remember the wrecks of so many attempts in this direction; but the systematic workings of these furnaces, at the several factories under his control, attest the correctness of his plans and the careful attention he paid to details, giving him as a reward unquestioned advantage over all competitors, an advantage held for several years already, against all opposition or new devices.

At a recent meeting of the American Institute of Mining Engineers, Mr. W. H. Adam, of New York, read a paper on the desulphurizing furnace invented by Mr. Spence, from which we gain these facts.

Although negotiations have been in progress for two years past, it was not until after the death of Mr. Spence that patents for this furnace could be secured outside of England, or that the study of its mechanism could be made; but now that Americans have the control of the invention in this country, and since, without doubt the perfected mechanical furnace will play an important part in the future treatment of all classes of ore containing sulphur, I deem it worthy of early mention before the Institute.

Fig. 1 shows the double furnace in perspective, the space occupied by it being 34 feet x 18 feet. When two double furnaces are coupled together and run by one engine (as preferred in all cases), the space required is 34 feet x 32 feet. A building 40 feet x 40 feet is therefore necessary to accommodate this plant, with a shed roof, if connection is made to towers and chambers, or an ordinary flat roof building with supporting posts placed between the furnaces, when connected direct with the chimney, as in the process of desulphurizing gold ores.

Figs. 2 and 3 (on page 325) are longitudinal sections which explain themselves.

A striking feature to the observer, however skilled he may be in mechanics or furnace working, is the simplicity of the parts, the certainty of the action, and the absence of all the complications attendant upon such operations generally. All the parts might be thrown together in a heap, yet so obvious are their forms and uses that any man of intelligence could put them together from drawings here given. The same may be remarked as to the furnace, which is simply a multiple-shelf type of the hearth furnace, used from time immemorial in every prominent mining center of the world.

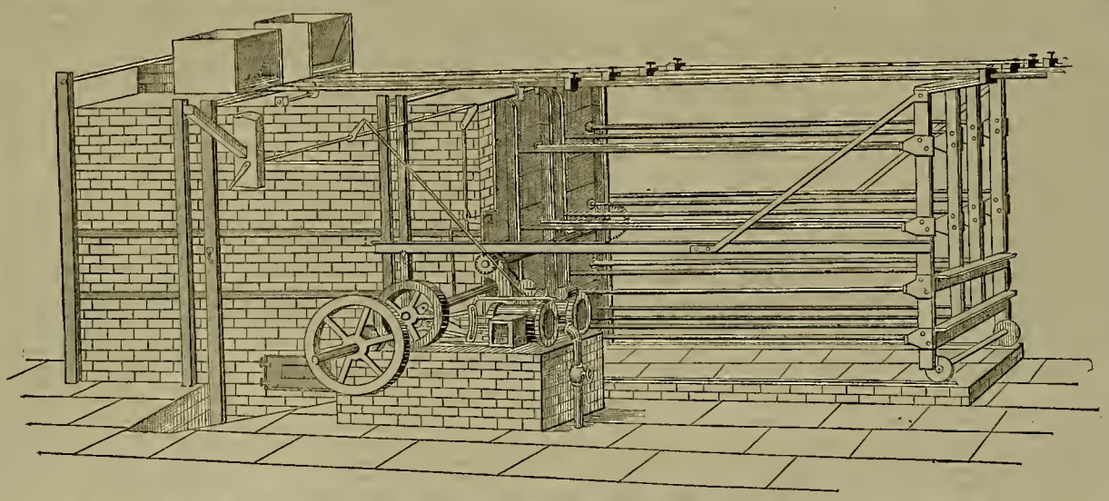

Fig. 1.—SPENCE DESULPHURIZING FURNACE, SHOWING ENGINES, RAKES, FEED HOPPERS, ETC.

Mr. Spence exemplified his well-known good judgment and practical mechanical sense in working from tried and satisfactory models; and whether he ever was led into experiments with any of the types connected with so much sorrowful experience to most metallurgists cannot be seen in any one part of this, his finished production, which is built from common forms of brick and tile, operated in a positive manner with little gearing, and adapted in all respects to every-day service.

There are several practical points of excellence about the furnace (which has been in operation near New York for past three months), which entitle it to careful examination by engineers. I do not think it necessary to enter into details connected with its workings, farther than to state generally the method of handling ores and the results obtained, leaving to those most interested the study of separate part, or special features.

The action of the furnace will be understood to be automatic, the ores being elevated from the furnace-floor, brought in from the floor above, or by other means supplied in quantities as required to keep the hoppers full. This matter of detail will be readily understood by those practiced in handling of ores from different levels, and the drying of ores (if wet) will also be understood to be a simple matter when small quantities are regularly fed.

The hoppers being filled, a small auxiliary engine is started, and by means of a changeable gear, properly connected, opens the valves to start the pair of engines shown in the foreground of Fig. 1.

These engines, having 7-inch x 12 inch cylinders, and running at 40 revolutions per minute (giving a minimum of wear and tear for the service performed), quietly and positively operate by means of geared wheels, the rods to which, in the furnace, are attached toothed rakes (Fig. 2).

The rods are very firmly held in place and position by the rack, which, supported at its rear end by wheels, travels along a railway.

The movement of the rack (with rakes inside the furnace) opens the ports for admission of fresh ore from the hoppers to the first shelf, and the discharge of finished or calcined ore from the lower shelf into cars. When the rakes have finished the forward stroke, the engines reverse automatically, and the rack returns to and stops in position. The auxiliary engine continues running, and at stated times (determined by the manager) again starts the large engines, another operation of stirring and raking with feed and discharge of ores taking place.

This automatic and regular method of feed and treatment of the ors on the bed of the furnace is the result of years of study and practice, directed to the object of replacing by a uniform mechanical procedure the discretionary operation of hand-labor.

By study of the plant now in operation, the following conclusions are reached:

1. The constituent elements of the ores being first determined, the feed and discharge is regulated to enact amounts in pounds, and the number of charges fed into the furnace is duly registered.

2. The auxiliary engine being set to start the motive power, say, every five minutes, and the time required for the forward and back-stroke being, say, one and one half minutes, it follows that the interior parts of the rakes are exposed to action of heat and acid fumes but one third of the time, thus approximating manual labor in wear and tear of paint.

3. The draft of air being regulated and controlled by the chemist at will, insuring the proper oxidation of the ores, and no more, less chamber-space must be required than by any other process of burning pyrites, and, moreover, no special care need be given to location of plant, since strong winds or variable currents can have no effect in causing "blow-outs" of gas at the doors.

4. The movement of the ores from the hoppers to the discharge opening is accomplished by a system of reversed teeth, which are positive in action.

The destrioration or destruction of cast-iron rakes and teeth has been reduced to a minimum by the simple but novel idea of *burying the parts in ore*, which accumulates at the front of the furnace beds when the rakes are at the position of rest (Fig. 3).

5. Pyrites "smalls," such as are found in Virginia, at the Milan or Capelton mines, carrying 47, 45 and 40 per cent of sulphur, respectively, can be calcined with two double Spence furnaces, run by one engine at the rate of 15,000 to 20,000 pounds per day of 24 hours, the cinders containing from 1½ to 2½ per cent of sulphur.

It is claimed that larger amounts of "smalls" containing copper, blende, etc., can be put through, and double the above quantity, where sulphur fumes are passed directly into the air—as would be the case in working auriferous concentrates.

6. Where necessity exists for bringing the sulphur-contents of cinders from iron-pyrites (FeS) down to ¼ to ½ per cent to utilize the iron, or, for the treatment of rich gold-bearing sulphurets, the result is accomplished by the addition of a fireplace to the lower hearth. This is shown in Fig. 1, although not ordinarily used.

By this means the proper heat is kept in the ores until they are discharged into the iron cars, but in general working the ores are "dead" on the lower shelf.

7. The average cost of calcining ores by this automatic furnace is not greater than by any other method at present in use.

The cost of the furnace complete, with power, is about the same as that of the equivalent grate-bar spaces in kilns, or equal burning space in the present type of shelf-furnaces.

Visitors to Bingham, Utah, will find comfortable quarters and good entertainment at the hotel kept by A. Klopenstine, in the upper part of town. Mr. K. is a pioneer in Bingham, knows everybody, and can give his guests any information about mines and men that they may desire.

The new annealing furnace at the malleable iron works at San Leandro is nearly completed.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Origin of Coal.

[Written for the PRESS.]

Emerson says: "There is at the surface infinite variety of things; at the center, simplicity of cause." It was formerly assumed by chemists that hydro-carbon could not be formed without the intervention of organic life. The geologists invented hypotheses to explain the formation of coal by the carbonization of vegetation.

Many theories have been formed and much ingenuity developed to describe how beds of peat or drifts of wood could form coal, if the surface of the earth would sink and cover the vegetation with water. We have shown (article in Vol. XLIX, No. 3, of MINING AND SCIENTIFIC PRESS) that the growth of vegetation for 100 years would make less than one inch of coal.

We now wish to suggest that later researches of chemists have made it probable that carbon is not forced to support any theory; on the contrary, it is a gas that combines freely with each of the other gases. Jevons says: "In the classification of the elements carbon stands apart as a substance entirely unique in its powers of producing compounds." * * * * "It used to be believed that the production of the so-called organic compounds was due solely to the action of a vital force, or some inexplicable cause involved in the phenomena of life, but it is now found that chemists are able to commence with the elementary materials, pure carbon, hydrogen and oxygen, and by strictly chemical operations, combine these together so as to form complicated organic compounds"—'Principles of Science,' Vol. II, p. p. 418, 419.

If this be admitted as true, we claim that we may with propriety reopen the question as to the origin of coal. From a mass of facts relating to the thickness, extent, form and strata of coal beds, we can show that coal occupies basins, with the least thickness at the edges, and a greater depth at the middle of the depressions in which it is found. This would naturally result from the solidification of a pond of petroleum. Helmholtz says (Popular Lectures, Atkinson's Translation, p. 198): "For apprehension by the senses supplies after all, directly or indirectly, the material of all human knowledge, or at least the stimulus necessary to develop every inborn faculty of the mind. It supplies the basis for the whole action of man upon the outer world; and if this stage of mental process is admitted to be the simplest and lowest of its kind, it is none the less important and interesting. For there is little hope that he who does not begin at the beginning of knowledge will ever arrive at its end. It is by this path that the art of experiment, which has become so important in natural science, found entrance into the hitherto inaccessible field of mental processes."

Huxley predicts that "*the method of Zadig*," applied to facts, will in no very distant future reconstruct our knowledge, as it enabled Zadig to describe the queen's spaniel and the king's horse. We find in some coal beds the roots of trees in the 'underclay,' the trunks, if of considerable size, are silicified, and with but a crust of coal adhering to the outside surface of the tree. The miners work around these petrified remains (which are really obstructions in the mines), and if the trunks project through the rock roof, these "pot bottoms" of the miners become dangerous, as they sometimes fall out from the enclosing rock. The leaves, fruits and insects discovered in coal are found in the lower strata, which would naturally occur if the coal were liquid hydro-carbon, or the objects were submerged by petroleum. Some of the most interesting specimens of animal life found in coal were discovered in hollow stumps preserved in the coal beds; these stumps had stratified shale in the interior cavities, analagous to the accumulations of dust or silt in similar stumps, which become the haunts of similarforms of animated life at this later period of the world's history.

Dana informs us that—"A bed of coal, even when purest, consists of distiuct layers." This is one of the characteristics of the coal strata, and there is also another fact of yet greater significance, the layers of bituminous coal have distinct planes of cleavage, horizontal to the layers of deposition—the seams split with the same regularity of similar layers of the stratified rocks.

As 'solidification is stratification,' by analogy we are directed to the *probability* of its former condition of a homogeuous mass of fluid or plastic matter. In the so-called "subcarboniferous" deposits of coal, we find the veins of coal enclosed in rock—coal alternating with slate, or conglomerate below and slate above. The name, "false coal measures," applied to these deposits does not mean that the coal is of inferior quality, but that it has not been formed in conformity with the "vegetation theory." As a matter of fact, lignite containing the greatest amount of vegetation, is relatively poor in carbon; while cannel coal and anthracite, in which no vegetation is found, are richest in carbon.

Antbracite seems to bear the same relation to cannel coal that metamorphosed crystaline rocks do to the sedimentary—altered by heat acting under great pressure. Jevons says—"Just as liquids which expand in solidifying will have the temperature of solidification lowered by pressure, so liquids which contract in solidifying will exhibit the reverse effect. They will be assisted in solidifying, as it were by pressure, so as to become solid at a higher temperature, as the pressure is greater. This latter result was verified by Bunsen and Hopkins, in the case of paraffin, spermaceti, wax and stearin."—Principles of Science, Vol. II, p. 179.

In a former paper (July 19th) we stated the fact that coals and bituminous shales, by distillation, yield gas and petroleum, so we now assume that mineral oil, by oxidation, becomes coal; that the correlation is such that hydrocarbon gas represents oil, as oil is the equivalent of coal, and that coal may be returned to oil or gas. There can be nothing new, perhaps, in this presentation of the subject, but we feel justified in calling attention to the advantage to be gained by a fair investigation of all theories relating to the origin of coal. A theory is neither better for being old, nor worse for being new. Jevons directs that as "The possible modifications of conditions in experiments are usually infinite in number, and infinitely numerous also are the hypotheses upon which we may proceed. Now it is self-evident, that however slightly superior the probability of success by one course of procedure may be over another, the most probable one should always be adopted first." Principles of Science, Vol. II, p. 286. On the ground, then, of *probability*, the question, Is coal fossil asphaltum? is offered for investigation. The problems for solution may be stated thus: If petroleum were forced to the surface by pressure, would it not flow to the nearest basin by the attraction of gravitation, and enclose and probably preserve such vegetation as it submerged. If a pond or lake of asphaltum should become solid and brittle, would it not resemble asphaltic coal? The tyranny of this "vegetation theory" is oppressive, and we can exclaim, like Ferdinand in "The Tempest,"

"And would no more endure
This wooden slavery."

Humboldt wrote: "What has been discovered does not by a long way exhaust the discoverable."

"Nature never did betray
The heart that loved her."

As anthracite coal and graphite are found in the Azoic rocks, the "vegetation theory" fails to account for such exceptions. E. E. C.

Something of the Mines of Nye Co., Nevada.

[From our Special Correspondent.]

There are many good mines here. Some of the best, however, are lying idle, or if worked at all, it is with a small force and under such disadvantages that but a small amount of bullion is produced as compared with the past, so that mining, on the whole, may be considered at rather a low ebb. Nothing is doing at present with the leading mine of Grantsville, although there is a large well-equipped mill on the ground and an abundance of good fair-grade ore to keep it running. Work, it is thought, will be resumed early next spring, if not sooner. About the same may be said of the best-developed mine of Ophir Canyon and of a number of others throughout the county.

Mining at Ione.

Mr. Langworthy is vigorously at work with a few men. He lays claim to four ledges, all true fissures, in a syenite formation. They are from 15 inches to 4 feet in width. The rock has worked from $50 to $200 per ton, chiefly in silver. A depth of 250 feet has been reached on the Indianapolis. The ore taken out from the surface to the lowest level has averaged $115 per ton. If he has the nerve to put up the necessary machinery to sink a few hundred feet below water level, there are hopes that Ione may yet become one of our most flourishing mining camps. The prospect, to say the least, is very encouraging.

Ophir Canyon and Vicinity.

Mr. H. H. Warne and others have two locations here, known as the Grizzly and the Cinnamon. They are rich in gold, and likely to prove exceedingly valuable. The claims are being opened by three tunnels, at different altitudes, all following the lodes into the hill.

One of the tunnels has been extended wholly in ore 120 feet; the lowest will reach a point on the lode at a depth of 400 feet from the surface.

A few tons worked at Salt Lake City for a test yielded for first-class, as high as $200 per ton. The rock improves as the work advances. Every effort will be made by the company to erect a mill at the earliest day possible. About five miles from the above, Messrs. Graves & Crosswhite have a recent location in the same district, which is showing well for the amount of development. It is in a slate formation. Four sacks, lately reduced at the Manhattan mill, in Austin, yielded at the rate of $400 per ton in silver.

It is understood that Mr. McLeod, in the same locality, is now down on the ledge about 60 feet. From 8 inches to 2 feet of ore is reported. Some 16 tons of selected ore worked up to $900 per ton for first-class, and as high as $400 for second-class, the lowest grade being laid aside for reduction hereafter.

In Jefferson District, prospecting is going on in several locations. In some instances small lots of ore are sent to Belmont for reduction. Mr. C. J. Kanrohat had just left Jefferson canyon with a load of rock. The result of the yield was not learned. Harrison Brothers usually spend the fall and winter in developing their mine and in taking out rock, which is worked in their arastra during the summer. It is understood that they manage in this way to make a living out of their mine. Others in this vicinity, it is said, are doing the same.

Work has been resumed on the Barcelona mine, at Spanish Belt. It is stated that with a full force at least 20 tons of high-grade ore could be extracted daily.

As the rock is rich in sulphurets, only about six tons are taken out per day, for the purpose of mixing with the ore of the Belmont M. Co., to render it more easy of reduction. The Barcelona is silver-bearing in the main, carrying a little gold, and is said to be the only silver ore on the coast that contains cinnabar. Mr. M. C. Fassett, superintendent of the Belmont mine and mill, informs us that the greatest depth attained by shaft is 600 feet. Present work is confined to the 200-foot level. Upwards of 1,400 feet of virgin ground are reported to the south of the hoisting works, with about 550 feet of backs. The rock is of a very high grade, but exceedingly refractory. Formerly only about 60 per cent of the metal was saved, with great cost for milling. It is now chloridized up to an average of 94 per cent, and at a cost of only $10 per ton for reduction. Leaching is the process now adopted, and represented to produce bullion from 900 to 950 fine, as against amalgamation which went only 300 to 325 fine.

The Two "G" Mine at Tybo

Has the reputation of being one of the best in this portion of Nevada. Although full notes were taken on the ground, they have unfortunately been mislaid, and a resort must be had to memory.

The ledge had been opened many years ago by the old Tyho Consolidated Co., down to water level and along its length for many hundreds of feet. It was found to average in the neighborhood of 3 ft in width, was looked upon as a true fissure, principally in porphyry and limestone with, beautiful smooth walls, and turned out many millions in bullion. The ore is argentiferous galena, and averages about $40 per ton—reduced by the old company by the smelting process, thereby saving the lead.

For the past three years it has been worked by Trobridge & Co. The ore has been reduced by mill process, and nothing but the precious metals saved, paying about $30 per ton. The mine was running with a small force, their operations being confined to the old upper works. It is the belief of the present company that there is yet an immense amount of rich ore below the water line, and that it is only a matter of time and capital when the necessary machinery will be furnished for its further development. When this is done Tyho will again see lively times.

Morey M. District.

The principal mine here has recently been shut down. It was operated by an Eastern company. It appears from the latest accounts, that they do not wish to put up the amount of money required for machinery to prosecute the work, but prefer to sell or lease the mine. Mr. Angus McArthur, a former foreman, and well-known among mining men, gives it a good record so far as the value of the ore is concerned.

It worked from $100 to $500 per ton. If any considerable quantity of such ore has been found, it should be worth following up.

Somewhat higher on the mountain there are three parallel ledges, known as the "Dannabrod," the "Norton," and the "Greyhonnd." The Dannabrod is from six to seven ft wide, the ore giving very good assays, some as high as $250 per ton, while float rock found on the ground goes to $500. It has an incline on the vein of 100 ft and a crosscut from its bottom which passes through the Morton, laying bare a large body of low grade ore from 10 to 12 ft in width. The Greyhound shows a width of about two feet. At a depth of 50 ft the Dannahrod No. 2—an extension—gives assays from $22 to $26 in silver.

These locations are understood to be the property of Mr. Claus Bonet, of Morey. The lodes appear to be well defined, and promise well for the amount of development.

Belmont, Inyo Co. A. C. K.

Finding the Value of a Specimen.

EDITORS PRESS:—In the article on the above subject, in my book on assaying, recently reprinted in the PRESS, I omitted to inform the reader that, for the purpose of determining the value of a specimen by weighing it, and each of the component substances in air and in water, it is not necessary that the water be pure, nor at standard temperature, etc., as it would be were the *true* specific gravity required. In this case the quantities required are only relative, and *any* water will answer the purpose. When a very close approximation to true sp. gr. is required, and the water at command is not pure, heat it until one c. c. weighs one gramme; it will then serve the purpose, though for rigid exactitude the barometric pressure must be considered.

In your issue of Oct. 1, '81, I gave nine different rules for finding the value of a specimen. I selected what seemed to me to be the easiest for the book, but I find that some prefer the second rule for those cases in which the specific gravities of the metal and the gangue are assumed, as is usual with gold in quartz. This rule is: From sp. gr. of specimen, multiplied by sp. gr. of gold, subtract sp. gr. of specimen, multiplied by sp. gr. of quartz, for a division, and from the same subtract sp. gr. of quartz, multiplied by sp. gr. of gold, for a dividend. Divide, and multiply the quotient by weight of specimen; the product is the weight of the gold. Taking the same example as given in the book:

$8 \times 17 = 136$	136
$8 \times 2.6 = 20.8$	$17 \times 2.6 = 44.2$
Division, 115.2	Dividend, 91.8

The quotient = 0.797, multiplied by 32, gives 2.55 ozs. of gold. C. H. A.

The South African Diamond Fields.

The following interesting account of the South African diamond fields, from recent official information, gives some idea of this vast industry: The quantity of blue ground hauled out of the Kimberley mine last year was about 350,000 loads, and the aggregate weight of the diamonds obtained was 947,877 carats. The average value of these diamonds was 22s. per carat, giving an approximate value of £1,044,000. The number of men employed, on an average, in the claims was 252 Europeans and 1,198 natives; the average number employed on the floors was 167 Europeans and 915 natives. The wages paid averaged about the same as in 1882, viz., from £5 to £8 per week to Europeans, and 30s. per week, with lodgings and wood, but not food, to natives. The Kimberley mine is described as an almost circular opening of comparatively limited area contained within a presumably running wall of hasaltic rock, and probably many hundred feet in thickness. The question of the future working of the mine has been earnestly discussed, in consequence of the falls of reef. Opinion differs upon the subject, but good authorities appear to consider that what is required is to carry on reef removal operations concurrently with mine working, and in advance of probable reef slips. As regards Old De Beer's mine, the estimated quantity of blue ground hauled out of it in 1883 was 700,000 loads, of 16 cubic feet each. The aggregate weight of the diamonds obtained was 426,728 carats. Reef was removed to the extent of 71,847 cubic yards at a cost of £25,268, while the water pumped out was estimated at 10,950,000 gallons, its pumping costing £10,800. There were only two slips of reef of any consequence in 1883 in Old De Beer's, but one slip caused the death of five natives. The daily average number of persons employed in the mine last year was 96 Europeans and 661 natives in the claims, and 101 Europeans and 602 natives on the floors. The rates of wages paid here were about the same as those carried on in the Kimberley mine. The area of diamondiferous ground at Old De Beer's is very extensive as compared with the Kimberley mine; at the same time the blue ground of Old De Beer's is not so rich as that of the Kimberley mine in the production of gems. The number of claims in the Dutoitspan mine is returned at 1,531, of which 1,395 were more or less worked in 1883. About one-third of the claims were worked uninterruptedly, and upwards of four hundred were worked for an average of 259 days, only those claim-holders who had not proper appliances were idle last year. It appears that seventeen more steam engines were got to work in the Dutoitspan mine last year as compared with 1882, the increase in the aggregate force at work being 105 horse-power. One mile of broad gauge and 14¾ miles of narrow gauge tramway were laid down in 1883. A valuation of the mine was made in 1883, and the total arrived at was £2,205,930. The assessment of the Bultfontein mine amounts to £660,185. Work was carried on earnestly in the mine during 1883. The average depth of the mine where it is worked is about 150 feet, but there are certain blocks of claims on the north and northwest side where little work has ever been done, and about forty claims which remain untouched. On the south and southeast side many claims have been cut out by reef, and it is feared that as the mine increases in depth more will share the same fate; at the present time a few claims are so covered with reef as to remain unworkable, so that the reef question will at no distant period demand the most serious attention of the claim-owners in the mine.

LEADVILLE *Herald:* The conviction of one who has been a careful observer of the mining interests for 13 years, and one, too, who never had anything to do with any of the new-fangled processes of reducing mineral, is that millions of money have been sunk all over this field on account of the ignorance and rascality of men. Clear Creek, Gilpin, Boulder, Park and Summit counties are full of wrecks of these worthless smelting and reduction works—works that never were adapted to the reduction of ore into bullion. The writer could point out more than a score of mills that cost from $50,000 to $300,000 that never paid, and this same insane process is still going on. New experiments are constantly being made, and nine cases out of ten are utter failures.

MECHANICAL PROGRESS.

Tempering Steel.

There is nothing so dear as cheap steel. It is much more economical to buy a tool made of high priced steel, that will last for a year, than to buy a tool made of cheap steel, that will become worthless in a month. Mr. Henry Seebohm, in a paper read before the late meeting of the Chester meeting of the British Iron and Steel Institute, said: The melting of the higher qualities of steel is a process requiring the greatest skill, and one of the principal reasons why the trade has become to such a remarkable extent localized in Sheffield is the importance to this branch of the trade of being able to select, from a large class of more or less experienced workmen the few exceptional men in whom sound judgment, technical skill and steady habits are combined. * * *

The culminating point in the manufacture of tools made from steel, the final process which gives to them their most valuable properties—properties possessed by no other metallic substance—is that of tempering. The steel was originally lead: the process of hardening has turned it into glass. But we do not want glass—it is too brittle; we want whalebone. An unhardened knife would bend like wrought iron; a knife hardened only would break like cast metal. We want the elasticity of the whalebone. Our knife must spring like—like what? Like steel. To attain this quality it must of course be tempered.

If a piece of hardened steel be heated slightly, and then allowed to cool, it becomes tempered. It suddenly changes from glass to whalebone, and in the process of changing its nature it fortunately changes its color, so that the workman can judge by the color which it has assumed the extent of the elasticity which it has acquired, and can then give to each tool the particular degree of temper which is most adapted to its special purpose. The various colors through which tempered steel successively passes are as follows: Straw, gold, chocolate, purple, violet and blue. Of course in passing from one color to another the steel passes through the intermediate colors. It really passes through an infinite series of colors, of which the six above mentioned are arbitrarily selected as convenient stages.

It must be borne in mind that the elasticity of tempered steel is acquired at the expense of its hardness. It is supposed that the maximum of elasticity and hardness combined is obtained by tempering down to a straw color. In tempering steel, regard must be had to the quality most essential in the special tool to be tempered. For example, a turning tool is required to be very hard, and is generally taken hot enough out of the water to temper itself down to a degree so slight that no perceptible color is apparent; while a spring is required to be very elastic, and may be tempered down to a blue.

Inventions Wanted.

Under the above head, several of our cotemporaries have called attention to inventions needed, or to special manufactures for which there is a present demand. One now before us, with similar relation, says:

There is hardly any field of invention which has been so little cultivated as the American house. For instance, what a disgrace it is to the mechanic arts in this country, that every stick of timber in every house is not fire-proofed by a cheap, practical process, the plant for which should become the second thing after a saw-mill to be erected in every new settlement! For want of a cheap, practical process for fire-proofing wood, one hundred million dollars' worth of property are destroyed every year in the United States. The carpenters have hitherto opposed such processes because the mineralized wood is less easily finished with the common tools. But a large part of all the wood in a house is used in the rough, and this objection need not apply to it. For the finished wood, let the fire-proofing and steam seasoning be done together, after all the finishing has been completed except the final fitting. For the final smoothing, if edge tools will not work, let us have new tools, carrying pumicestone or other abrading and polishing material.

We are entering upon a new and more complex system of domestic architecture—the family club house or social palace—which will require a host of new inventions. It is not looking very far ahead to see whole towns built in this way. These buildings must have their internal railways and elevators of all sizes. They must be tunneled for hot and cold air flues, ventilating flues, with artificial draught, steam, gas, water and sewerage pipes, and speaking tubes. They must be equipped with an electric generator and electrical wires for light, power and telephony, with artificial refrigerating as well as heating apparatus, with gas generators, and the most perfect cooking and washing machinery. All of this machinery must be made on a large scale, with a capacity of subdivision.

A NEW PRINCIPLE IN MECHANICS[?]—The Louisville *Courier-Journal*, described something recently seen by its reporter, which the inventor claims to be a new principle in mechanics, by means of which he "can multiply the power of any motor without loss of motion, a feat heretofore considered impossible." The device is described as follows:—On a chair stood an ordinary white wood box, with a shaft from one side, at either end of which were attached iron cranks of equal length set centering on each other. He first gave an illustration of the power of the machine by attaching a 5 pound weight to one crank and a 12 pound weight to the other at an equal elevation from the floor; then letting both loose, the lighter weight raised the other to the height of the crank. On being questioned, the inventor said: "I have worked on different plans for 16 years, but could never get the idea that would give me the result until a short time ago, and it is so simple that I am actually ashamed of it. I know that the principle is correct and that it is original. I have examined over 900 attempts in the same line made by other inventors without having attained the object they aimed at. There are but three pieces to the attachment, and they can be fitted to any stationary, locomotive or marine engine in a manner that will increase their working power over 125 per cent without any loss of motion. I have shown the working of my machine attachment to several machinists and engineers; who are all astonished and predict a grand success for it."

The "Upsetting" of Iron.

The quality of movement of the particles of iron under pressure or percussion is a remarkable one, whether the change in arrangement is made while the iron is hot or when it is cold. Red hot iron can be pressed to fill a mould as clearly and exactly as so much wax could be, and the grain of the iron will certainly follow all the contour of the mould. Thus the heads of pick-axes and articles of a similar form can be shaped by pressure, the metal that is removed to make the hole for the helve being forced to form the projection of the adze like head.

Cold iron can also be moulded into form by pressure, a method largely practiced to finish drop forged iron articles. The heading machine for making rivets, bolts, and wood screw blanks shows some surprising results in the compression of iron: a No. 6 one inch screw requires a piece of wire slightly more than one and a half inches long to form it. Yet the total length of the screw blank, headed, is just one inch. Of this the countersunk shaped head is one-eighth of an inch by five-sixteenths of an inch widest—or top—diameter. Now, it has been proved by experiments with shorter bits of wire, that less five-sixteenths of an inch of the extra eight-sixteenths is required to form the screw head. What becomes of the remaining more than three-sixteenths of an inch in length of the original one and a half inches that makes the one inch screw blank? There can be but one answer—the iron is driven upon itself; in other words, three-sixteenths of an inch of wire is compressed into seven-eighths of an inch (measuring under the head), so that one inch and one-sixteenth of wire is compressed into seven-eighths of an inch in length, without increasing the diameter of the wire.

IMPORTANCE OF REGULATING STEAM. Very little additional power is gained in any engine by allowing the steam valve to be open at over half stroke, and much less is lost in the crank and by dead centers than is generally supposed. From the above suggestion, the necessary failure of engines, when expected to yield the full boiler pressure power, in actual use is made quite apparent. If, besides allowing amply for friction, a further allowance of 25 or 30 per cent is made for the governor and for a reserve, sufficient power in engines will generally be provided. The omission to do this has caused many advertisements of "a good second-hand engine for sale, having been replaced by a larger one." Inattention to the temperature of feed water for boilers is entirely too common. When the escape steam of the engine can be brought into water heaters, no water should be supplied to boilers at much less than boiling heat. A heater that does not furnish it, and a pump that fails to force it in at that heat, should be thrown out at once.

SET-SCREWS projecting from any part of machinery are a dangerous nuisance. Accidents are continually occurring, both to the machine and mechanic, caused by belts and clothing getting caught. A belt slips off, catches on a set-screw, winds up, and if the belt is old, it breaks; if strong, the hangers must break or pull down. The shaft bends at the next hanger, and, like an immense flail, deals destruction on every side. Have set-screws, especially in collars, made with a square hole in the head end. Put a square piece of steel in this hole, turn with a wrench, and you can tighten up just as well as if the screw stuck out in the way an inch and a half. Of course this screw comes flush on the outside.

HOLLOW AXLES.—Hollow axles are stronger to resist twisting than solid ones containing the same quantity of matter. For if a hole is bored out of an axle of half its diameter, this reduces its weight one-fourth (because circles are to one another as the squares of their diameters), but the strength of solid cylinders being as the cubes of their diameters, the part taken out by boring had only the eighth part of the strength of the whole cylinder, and therefore when taken out would reduce the strength of the whole one-eighth.

SCIENTIFIC PROGRESS.

Philadelphia Electrical Exhibition.

The Electrical Exhibition, which was closed at Philadelphia Oct. 11th, was a most pronounced success in every respect. On settlement of all accounts it has left a surplus in the hands of the Institute, under whose auspices it was given, of about $20,000.

It was no less a success scientifically. It attracted the personal attention of the most distinguished men of science of the United States, and many of the leading British and Canadian scientists, whose personal service on the Board of Examiners to test and report upon the various groups of exhibits, will doubtless give to their reports, when they appear, a high scientific value.

The rapid progress of electrical science during the past 10 years has awakened the interest of all intelligent people, and the fact that much of this progress has been due to the ingenuity of American inventors, made the time and opportunity a fitting one for the holding of an electrical exhibition in this country, and it was especially fitting that this important undertaking should have been taken up by a scientific body of such assured standing and unquestioned respectability as the Franklin Institute.

The history of the Franklin Institute is inseparably interwoven with the progress of American industries, upon which the impress of its influence has been left in indelible characters, and the Electrical exhibition is the fitting crown of the career of this useful organization.

THE DARWINIAN DOCTRINE.—To Professor Dickson, of the University of Edinburg, it has seemed impossible that the Darwinian doctrine of evolution should ever advance beyond the position of a hypothesis, and that, while it presented some attractive features, it was at the same time beset with very serious difficulties. First, it appeared almost inconceivable that the wonderfully refined perfection we see in the more highly organized forms could have resulted from the haphazard accumulation, under natural selection, of small variations. Second, it was very uncertain that the time required for evolution by natural selection was not much longer than that of the existence of the earth in a habitable condition. Third, even admitting the imperfection of the geological record of past organisms, we could hardly conceive how there were not more traces of the innumerable intermediate forms which, on the hypothesis, must have existed. Fourth, it was to be observed as a distinction between "natural species" and the varieties of a historically known stock, that while, as a rule, the progeny produced from the crossing of two species were infertile among themselves, there was yet, so far as he was aware, no such infertility of the offspring of even the most divergent varieties of a historically known common stock.

IMPROVED FOG SIGNALS.—Fog signal apparatus is now constructed in such a manner that, in calm weather, its sound may be heard 20 miles. This power is gained by two slotted cylinders, one fixed and the other revolving in it. The slots, as they pass one another, stop or cut off the passage of compressed air or steam, and thus cause a series of vibrations, and, consequently, a musical note, the pitch of which depends upon the speed of the revolving cylinder. In order to vary the note, it is only necessary to control this velocity. The double note horn is formed with a casing within which is a fixed slotted cylinder and a revolving cylinder moving upon a spindle. The slots are formed in each cylinder at opposite inclined angles, so that the motive fluid impinging against a number of inclined planes causes the inner cylinder to revolve with great rapidity, carrying with it two disks, attached to the common spindle, and upon their peripheries are pressed levers, under the action of small pistons operated by diaphragms, to the outer surface of which compressed air is admitted. When the high note is required, one brake is put on; for the low note, both brakes.

MENTHOL.—This substance has recently been brought into notice as a remedy for headache and neuralgia. It is a white, semi-crystalline body, with a strong, burning odor of peppermint, and is usually made into small cones, mounted on a wooden bundle, and sold under the name of "pain pencil." It is rubbed over the locality of a headache or other pain. A burning sensation is first felt, following by a feeling of refreshing coolness and temporary relief of the pain. The liquid oil of Japanese peppermint has long been used in Japan and China for this purpose, and travelers have frequently brought home small vials of this oil, inscribed with Oriental hieroglyphics, and warranted a sure destroyer of pain. Menthol is simply the solid constituent of this oil. Chemically considered, it is a camphor. In the liquid oil of peppermint it exists in solution with a liquid hydrocarbon of the turpentine series, but can be readily crystallized out. Its medicinal effects are probably due to the counter-irritant it sets up; but the strong, agreeable odor of peppermint may also have some effect on the nerves. Although the relief it gives is generally only temporary, yet it is certainly harmless, and may prove a valuable addition to our list of popular remedies.—*Popular Science News.*

NEW ELECTRIC BATTERIES.—A novel thermo-chemical battery has been invented by M. Vincent Rintti, professor of the Polytechnic School at Torli, Italy. The production of the currents results from the difference of temperature of two layers or strata lying at different levels in a vessel filled with liquid. The cell consists of a wooden box or vessel, traversed by two copper pipes, placed the one over the other, and separated by a distance equal to about half the hight of the vessel, which is filled with a solution of sulphate of copper. A current of steam passes through the upper tube, and a current of cold water in the lower, with the effect that copper is deposited on the latter, while the substance of the former is reduced. By changing, from time to time, the position of the tubes, equilibrium is established. This battery is said to work well and not to polarize, but up to the present no practical information as to its performance has been published, and consequently we cannot do more than call attention to the principle of its action.

A CURIOUS EXPERIMENT.—A Parisian, M. Treves, has made the following curious mechanical experiment: Two steel tuning forks brought to the same pitch were topped with small mirrors, and placed opposite to each other in two vertical planes at right angles. One of them, No. 1, was, moreover, surrounded with a strong coil of wire receiving an electric current from a nitric acid pile, composed of four elements. A fiddlestick being now drawn across each of the tuning forks, the vibrations commenced, and immediately a perfectly motionless luminous circle was produced in the mirror of No. 2. But no sooner was No. 1 magnetized by the admission of the current than the circle becomes an ellipse, and swayed to and fro, denoting the action of a new vibratory motion. As soon as the current ceased, the figure became a fixed circle again. This experiment may serve to investigate the vibratory powers of iron and steel, according to their composition and physical state.

A MEGAPHONE.—This is a recent invention designed especially for use on ship board. It is a machine for magnifying sound, a sort of telescope for the ear. The purpose of it is to enable a person to hear or carry on a conversation with people at a distance, and it is constructed of two huge cone-shaped tubes eight feet long and three in diameter at the large end, which diminish to an apex in the form of rubber tubes small enough to place in the ear. Between these tubes are two smaller ones, constructed in the same manner, but not more than half the diameter. By placing the rubber tubes in the ear and speaking through the smaller cones the person can hear and be heard at a long distance, and the purpose of the invention is to aid mariners in listening for the sound of breakers or carrying on conversation with people on shore or on other vessels at a distance.

COAL AND ELECTRICITY.—A Pittsburgh prophet makes the assertion that in 50 years, perhaps in 25, coal will not be carried from the mines to its places of destination in bulk, but only its actual heat energy transported, and that by wire. This process, he says, can be accomplished by converting the coal into heat, the heat into motion and the motion into electricity. A storage battery at Cincinnati would take it up as fast as generated at the mines. From this battery it could be taken out and converted back into motion and beat, or changed into light. It is only a matter of time, perhaps, until this and still more wonderful things are done. And to-day, we are told, Edison is working upon some such idea as the above.

COLOR OF THE TEETH.—A dentist of prominence tells a correspondent that there are no such things as white teeth, as can be proved by contrasting those called white, with snow, raw cotton or marble. Roughly, he says, teeth can be divided as regards color into blue, gray and yellow, with hundreds of different shades. The apparent whiteness is due to the complexion and hue of the lips, and the "glistening ivories" of the negro are, as a rule, so exceedingly yellow that they would disfigure a white person. It is the black skin, hair and eyes that make them look white.

VEGETABLES ABOVE AND BELOW GROUND.—A scientific writer calls attention to the fact that those vegetables whose eatable part grows underground—such as potatoes, parsnips, beets, turnips, and the like—are heat-producing; while those which form above the surface—as asparagus, pease, lettuce, melons, corn, cabbage, tomatoes and such vegetables—are cooling. It follows, therefore, that the former should be kept for cold weather, and the latter varieties used in the summer months.

PHOTOGRAPHING FACES.—A New York photographer is quoted as saying: "After twenty-five years' experience under the skylight, after photographing over 147,000 people, I have become convinced that in 19 cases out of 20, the left side of the face gives the most characteristic likeness, while to the same degree the right side is the most symmetrical."

MINING AND SCIENTIFIC PRESS.

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W. B. EWER.....SENIOR EDITOR.

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SAN FRANCISCO:

Saturday Morning, Nov 22, 1884.

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☞ *See Advertising Columns.* ☜

Passing Events.

People are beginning to settle down to business again, now that the Presidential contest has been decided, and everyone has hopes of a revival of trade after many months of depression.

There is little to report new in connection with mining matters aside from what we have chronicled in our mining summary. The accidental striking of a stringer which led to a rich quartz lode, in grading a mill site in Sierra county, shows one of the numerous possibilities of a gold mining region.

Notwithstanding it was supposed California would be without a mineral exhibit at the coming New Orleans Exhibition, it has been found that a private citizen has come forward who sends a very fine collection of minerals at his own expense. It was sent this week, and will make a very creditable display.

The first of the winter storms may now be expected any day in our mountain mining regions, but in most places they are prepared to keep at work until winter. The prospectors, however, will have to hunt winter quarters and cease their occupation for several months to come.

The Comstock Mines.

A good many persons seem to imagine because so much prospecting and dead work is going on about the Comstock mines, and no dividends are being paid, that the vein is yielding no bullion at all. This is not by any means the case. The amount produced would at any other camp be thought considerable, though it is costing more than it comes to. But while we learn generally that such and such a camp is producing so many thousand dollars a month, we are seldom given the figures of the cost of production, and to most persons these statements appear as profit. On the Comstock, however, the assessor's figures give not only the yield but the aggregate cost at each mine. By these figures it is shown that while during the last quarter nearly $700,000 was produced, it cost over $20,000 more than the amount yielded to get it out. The report of the assessor of Storey county, Nevada, for the quarter ending September 30th gives the yield for the quarter of the Comstock mines as follows:

	Yield.	Cost.
Hale & Norcross	$57 508 93	$ 89,013 30
Ophir	26,884 42	21,882 15
Potosi	44,227 50	42,217 50
Belcher	112,705 54	108,703 89
Crown Point	123,498 65	118,213 57
Kentuck	88,514 10	62,858 05
Imperial and Challenge	15,259 56	18,566 00
Yellow Jacket	214,698 33	290,778 74
Lady Bryan	1,062 50	1,865 00
Monte Cristo	1,376 62	2,245 75
Mariposa Mill	21,890 30	21,116 56
Total	$889,142 20	$777,725 51

Following were the values per ton of the ore extracted: Hale & Norcross, $13¾; Ophir, $15; Potosi, $10½; Belcher, $13; Crown Point, $11.23; Kentuck, $10½; Imperial and Challenge, $16.37; Yellow Jacket, $14½; Lady Bryan, $6¼; Monte Cristo, $3.72.

While these results are unsatisfactory as far as showing any profit are concerned, they prove that the work being done is not entirely without results. In prospecting operations in deep mines heavy expenses have to be incurred, and these mines are exceptionally deep ones. The men at work there are confidently hoping that at any time a bonanza may be found which will abundantly repay them for all their work, and patient, intelligent prospecting is the only way to find it. They have of late been reducing expenses to the lowest possible limit, consistent with thorough work, and keep digging away day and night in the bowels of the earth with a persistence and patience that is to be admired. If energetic and intelligent efforts will avail anything in the search for the coveted rich ore bodies, these men are well prepared, and they set, in this respect, an example to the mining world.

Solution of Copper by Acid.

In several European works where they work copper ores, the sulphurous acid from roasting pyrites and blende is introduced with steam beneath the false bottom of the leach tanks and is allowed to permeate the moistened mass of oxidized ore. The conditions are very favorable to the production of sulphuric acid, which attacks the copper oxide. Dilute sulphuric acid is also in many places in Europe used as a solvent of oxide of copper from ores. The bluestone of commerce is made by attacking pure copper oxide with sulphuric acid, the sulphate formed in roasting ore or matte seldom being free enough from iron oxide to yield pure crystals. Formerly old sheet copper was the source of most of the blue vitrol, but of late, both in Europe and this country, silver-bearing copper matte concentrates until almost all the iron has been eliminated, and then roasted at a temperature which renders insoluble what iron remains, and treated with sulphuric acid, has supplied more than the demand. The copper oxide made at Hill's Works, Argo, Colorado, comes to market in this form: the Baltimore Copper Works treat their silver bearing ores and matte in this manner, and several of the lead smelting works which produce copper swell the production of blue-stone.

The supply in Europe is so far in excess of the demand that the sulphate of copper in some works is heated in close vessels, the acid distilled off and collected for use again, and the resulting pure oxide of copper melted. In Nevada an impure bluestone is made from a carbonate ore of copper and from copper cement, for use in the silver mills, though in some European works sulphuric acid, alone, or in connection with other reagents, is used as a solvent of copper, to be afterwards precipitated. In this country it is too costly to be so employed, unless it is made in the metallurgical operation itself. Mr. James Douglas, Jr., says it is, if anything, a more active solvent than dilute hydrochloric acid, at the same temperature, but if suboxide of copper is present in the roast it breaks up into protoxide, yielding up sulphate and metallic copper, which, at a low temperature, it does not attack, and which therefore escapes solution.

A Pneumatic Mining Tube.

Harvey R. Leonard and William Corcoran, of this city, have patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, an apparatus for working beneath the surface of rivers or bodies of water, and providing a point of departure from which tunnels or drifts may be run in various directions for raising auriferous or other material. A heavy boiler-iron tube is provided which has an open bottom and extends down to the desired point. At the top is a plate or door fitted to be opened or closed, and having its flanges made air tight, and a short distance below is another door, the space between forming an air-lock.

A pipe is connected with the air-compresser, and through it air is forced into the tube below the lower door, which is closed under the water pipe which extends to the bottom of the tube, its upper end discharging into a sluice. When the water has been forced out by the pressure of the air, the men can enter the chamber between the two doors, and the upper one being closed, air is admitted from the tube below into the chamber through a special equalizing pipe, until the pressure in the chamber being the same, the inner door is opened and the men can descend into the tube by means of a ladder or other convenient means.

A sump at the bottom enables the water, sand or auriferous material to be raised, and as the water pipe dips into it, the pressure of air draws the material up as long as it is supplied. The contents of the sump are kept stirred so that the mass will be homogeneous and will be elevated all together.

As excavations are made away from the bottom of the tube, the tunnel is to be well timbered until say about 20 feet are run, when a second elevator tube is sunk so that its side is opposite the tunnel. The bottom of this second tube is slightly below the bottom of the tunnel and is closed tight. An opening is made into the tube opposite the tunnel, and a door fits it, closing from the outside. The interior of the tube is made smooth and a cage is fitted into it having the ends packed air tight. A pipe passes through the cage, its lower end opening below it, and the upper end is connected with a flexible tube, which extends to the top of the tube and connects with a pipe leading to the air compresser. Through this pipe air is admitted by means of a cock, and passing below the cage will raise it to the surface, the flexible tube coiling on the top of the cage as it goes up. A pipe is provided passing through the cage, with a cock, by which the air below the cage may be allowed to pass out above when it is desired to lower the cage.

Another pipe leads from the tunnel into this cage tube at the bottom below the cage, and having a cock by which the air may be admitted from the tunnel when the cage is to be operated from the outside by an attendant. A cock opens from the tunnel into the cage so that air may be admitted to equalize the pressure, after which the doorway is opened. A car is fitted to run from the tunnel into the cage through the door, and rock or other bulky material may thus be raised or lowered. The operation will then be as follows:

The cage will be lowered by opening the cock in the pipe, which allows the air to pass above the cage, which will then sink to the level of the tunnel, the flexible pipe uncoiling as the cage goes down. When the cage reaches the level of the tunnel, air may be admitted to it through the pipe until the pressure within the cage equals that in the tunnel. The door may then be opened and the occupants of the cage may leave, or if anything has been brought down it may be removed. When the rock or car is placed in the cage the man in the tunnel can replace the door, and those within the cage may open the cock in the pipe which passes through the top of the cage to insure the sealing of the door.

If the cage is to be raised by the operator within the tunnel, he will then open the cock and admit air directly from the tunnel to the space below the cage, thus elevating it; but if the occupant of the cage is to operate it he opens the cock in the proper pipe and allows the air from the compressor to pass through this pipe to the chamber below the cage from the flexible tube and thus raise it. A door in the tube corresponding with the position on the car when the cage has reached the top, allows the car to be run out.

This mechanism gives a convenient mode for entering or leaving the works, and for conveying workmen, timbers or other material either up or down, and without so great a pressure as would be necessary if it must be forced up through the pipe. The air pressure is kept more equal, and the use of the air from the tunnel to raise and lower the cage in the secondary tube admits of changing the air and keeping it pure.

California Minerals for New Orleans.

The California Commissioner to the exposition at New Orleans has made strenuous efforts to have the collection of minerals belonging to the State, at the Mining Bureau, exhibited at the exposition. But it seems no authority could be found for their removal from the State, though there was nothing either to prohibit it. It was finally decided that they should not be removed.

California will not be unrepresented in this particular, however, as a very fine private collection, belonging to Mr. Dohrman, of this city, has been packed up and shipped. The collection will fill eight large cases, eight feet long by two feet wide. Although by no means as large as the State collection, in some respects it is superior, especially in the matter of gold specimens. It will be recollected that some time since the valuable gold specimens were stolen from the Mining Bureau. In Mr. Dohrman's collection are many rare and valuable gold specimens which were gathered years ago when this class of material was more abundant than it is now.

Some of the rarest and most beautiful forms of gold are embraced in these specimens, and the collection is especially rich in crystallized gold. Some idea of the size of the collection may be had from the fact that it took over six weeks' labor of two men in putting it up and arranging it before shipment from here. Every specimen will have a number and a description card. Each specimen is mounted on a small wooden pedestal, so as to be readily examined.

There are several thousand specimens which will average from two and a half to six inches. Mr. C. D. Voy goes to New Orleans in charge of this special exhibit. He has had much experience in this line, and is well posted on the mineral resources of the State. He will give as much information as possible to those in search of it. His expenses are paid by Mr. Dohrman, who deserves great credit for his public spirit. The collection is really a very valuable one, and is the largest private one in California. It has already been shipped, and Mr. Voy left last week to arrange it. Space has been procured, and the cases for their reception were made here and sent on with the minerals.

In addition to this, there are now being made in this city two cubes, which are to represent the total production of gold and silver in this State since the time of their original discovery to the present date. They are to be made of red and pine wood and sent to the Exposition in sections, being furnished with screws and the various parts being numbered. The face of the cube, representing the production of gold, measures 14.3 feet, and denotes a total yield of $1,049,323,545. The silver cube measures on its face 12.3 feet and represents a yield of $26,000,000. The cubes will not be covered until after their arrival at New Orleans, the gold and silver paper that is to be used for that purpose being shipped from this city. They will be finished in a few days and will remain on exhibition at the Mining Bureau for a short time previous to being packed.

CHARLES BARLOW, of Nevada City, inventor of the new rock drill, has returned from the East, where he went to make arrangements for the manufacture of his drills. The machines are to be made at Pittsburg, Pa.

Bingham Canyon, Utah.

One of the Most Thoroughly Prospected Mining Districts of the Territory.

[From Our Traveling Correspondent.]

Bingham is easily and quickly reached from Salt Lake City. Taking the Denver and Rio Grande train at 7:30 in the morning, we are carried on the main line south as far as the junction near Sandy, where branches extend eastwardly to Alta, in the Wasatch mountains, and westwardly to Bingham, in the Oquirrh mountains. We reach our destination before ten o'clock. The little engine puffs hard in coming up the grade of the canyon from Salt Lake valley, and stops a little short of the heart of the mining settlement, as the grade from the terminus farther up would be too great for ordinary steam cars. So the passenger will take to a coach, which stands waiting, and soon is landed at one of the hotels of the town, some half mile up the canyon. The settlement extends all along the route, the cottages or cabins being located without much reference to streets or grades. Some of them are neat and tasty, with little fenced yards about them; others are about as miners' cabins will average—innocent of paint, and rather forlorn in appearance. Stores and saloons are scattered along amidst the houses. Bingham extends this way for over a mile; then there is a gap between the houses, and we come to another little settlement, at the branching of the canyon, near the store of Duncan McInnes & Co. Mines are found in both of the canyons above, so that the settlement continues, though from here on it is more sparse. Thus we have congregated in Bingham Canyon a considerable community. All of the people are dependent, directly or indirectly, upon mining interests. As one rides up or down the canyon, or over the hills to other canyons, he notices dozens—or, we might say, hundreds—of prospect holes, or tunnels, or abandoned mines, or mines on which work is now in progress. No other district which the PRESS correspondent has visited has been so thoroughly explored as this. And yet the miners tell us that the region has not by any means been closely prospected, and that new discoveries are being made all the time. During our visit, a mere novice came in with samples which seemed to indicate that he had found a good ledge, and, as if to assure himself and others that it was a real discovery, he said: "It was more than 500 yards from any other hole, too." But, despite the numberless locations around Bingham, and the large number of mines being worked, and the larger number which it might pay to work, there are not yet any pre-eminently extensive or rich workings such as characterize the other districts described in previous letters. But Bingham Canyon is a good ore-producing region, made so by the accumulated supplies of a larger number of working mines than in any other district in the Territory.

Speaking of the mines in the order of their present prominence and productiveness,

The Lead Mine

Will easily take the first place. This mine was so named from the prominent character of the galena ore first taken from it. At present the first-class ore runs from 40 to 55 per cent lead, with 8 to 25 ozs. silver to the ton. The mine is located but little more than a mile in a direct line from town, but this direct line goes straight through a high mountain, so that the road and trail are fully three miles long. The ore from the mine is taken to the mill, on the line of the railroad, two or three miles below town, by means of ore cars on a well-constructed tramway, miles below the motive power. At present the mine is producing 90 to 100 tons ore per day, some 20 tons of which is first-class, and goes direct to the Morgan smelter, near Salt Lake. The balance of the ore goes to the mill for concentration. The ore is now taken mostly from the 290-foot level. The mine is well prospected and opened out. Large bodies of second-class ore are exposed. We were told that the mine never looked better than at present, and certainly the workings were never so efficient and thorough. The company also own the Wasatch mine, a short distance from the Lead, which is also being put in shape to become a good ore producer soon, as 5,000 to 6,000 tons are now exposed. At these two mines, about 75 to 80 men are employed, who are boarded by the company, right on the grounds.

At the mill about 25 men are employed. The works here are entirely for the concentration of second-class ore. From ore running as low as 11 to 20 per cent lead, a concentrate is produced, running from 50 to 70 per cent, with an amount of silver corresponding to that found in the first-class ore. As before stated, the concentrator handles something over 70 tons of ore per day, and it does its work smoothly and well. The superintendent of smelter is C. H. Agramonte, Esq., a mining man of varied and valuable experience. The party to whom the present prosperity of the Lead mine is greatly due is Mr. Nicholas Treweek, general superintendent of mill and mine, who has, since he took charge, so shaped matters that there has been constant progression and increasing profits. He has an able lieutenant in Mr. John Trewsek, his brother, superintendent of the mines, a thoroughly practical man. The principal owners of the Lead property are C. L. Nash, Esq., of Omaha, and A. Hanauer, Esq., of Salt Lake City. The former of these gentlemen has lately visited his property, and we think must have been impressed with the idea that he has a valuable investment in our western country.

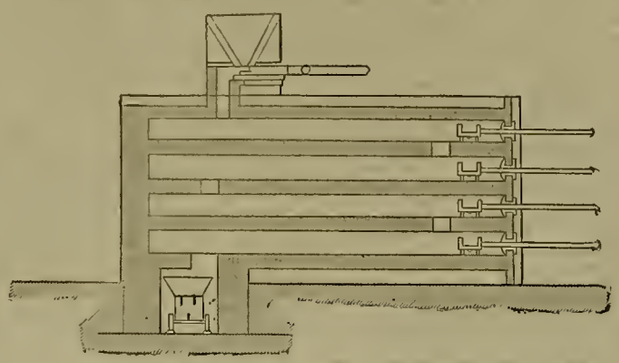

Fig. 3.—SECTION OF SPENCE DESULPHURIZING FURNACE.

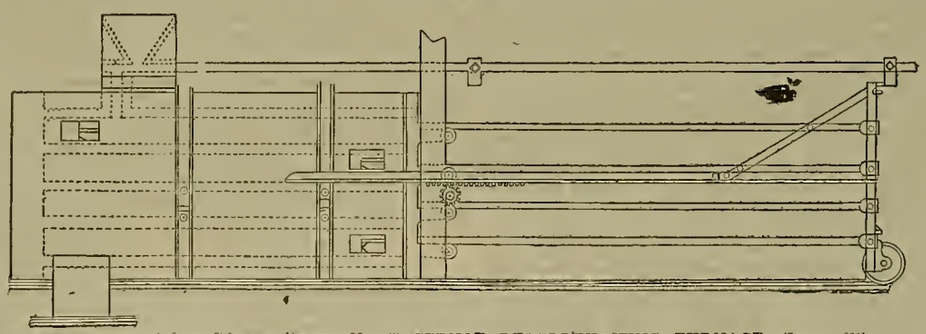

Fig. 2.—LONGITUDINAL SECTION OF SPENCE DESULPHURIZING FURNACE.—(See page 321).

The Yosemite and Brooklyn Mines.

Not far from the Lead Mine—in a neighboring gulch—are the two mines just named. They lie within close proximity. The former is, we believe, the older location. It has seen its ups and downs, and its machinery has seen much service. At present the mill or concentrator is working on the second-class ore, while the first-class ore is sent directly to Sandy. The ore and concentrates contain 45 to 50 per cent lead, with 14 to 15 ozs. silver per ton, and a trace of gold. Developments are now in progress to lay bare new bodies of ore. John Beveridge, a practical miner, is foreman of the Yosemite. About 20 men are employed.

At the Brooklyn some 90 men are employed. The ore product is 45 to 50 tons per day, nearly all of which is concentrated by the works at the mine, and sent almost entirely to the Mingo smelter, at Sandy. The ore is similar in grade to that of the Yosemite, above described—viz., 50 to 55 per cent lead, 8 to 14 ozs. silver to ton, with a trace of gold. The ore supply seems to be abundant. An incline follows the trend of the ore vein, which dips at an angle of 38 degrees. This incline has descended 1,200 feet, and there are drifts at every 100 feet. There are fully 9,000 feet of drifts in the mine, besides shafts, winzes, etc. The mine has been operated about two years by the present company. The owners are mainly Eastern parties, living in Brooklyn, N. Y., hence the name it bears. J. J. O'Toole is superintendent and manager; Wm. Carruthers, day foreman; A. P. Mayberry, assayer and night foreman. The Brooklyn will eventually become a larger ore-producer than it now is, as work is being prosecuted with vigor, looking to that end.

Going up the canyon from Bingham, the first mine of importance is the

Old Telegraph Mine.

This property was at one time one of the principal mines of the district. At present it is worked on a lease by Messrs. Hazelgrove and Mullett, who employ 15 to 20 men. A mill was erected several years ago by the original company—the same incorporation which owns the Lexington property at Butte City—at an expense of $10,000. Here the milling ores can be treated. But the main product of the mine is smelting ore, of which some 200 tons per month, worth $30 per ton, is produced, which is sent to the Salt Lake smelters. These same parties have had the mine under lease since 1881, and are to hold it until 1886, when we hope they can make arrangements to purchase the property. They have a tunnel into the side of the hill some 1,000 feet, which strikes the vein 400 feet below the surface croppings. The ore is sent down to the railway depot from the mine over a tramway two and a half miles long. A short distance above the Old Telegraph, in a different canyon, is the

Spanish Mine and Mill.

This property is managed by the Bemis Brothers, who own a third interest in the mine, and lease the other two-thirds. They have lately completed concentrating works on a small scale, which are running admirably. They handle 40 tons of crude, second-class ore per day, while 10 tons of first-class ore are shipped with the concentrates to Denver. The first-class ore will carry 55 per cent lead, with 15 ozs. silver and $5 in gold to the ton; the concentrates will run a little better than that. The Bemises employ 25 to 30 men. They have run three tunnels into the hill, the lower of which cuts the vein at 175 feet below the surface. The ore vein varies from 5 to 30 feet in width. There seems to be abundance of ore in the mine. The adjustment of responsibility about the mine and mill is about as follows: A. H. Bemis, general superintendent; G. L. Bemis, superintendent mine; F. H. Bemis, superintendent mill; and we think we might add: Mrs. E. Bemis, superintendent boarding-house, which we venture to say, is a good one.

Black Jack Gulch.

This is the local appellation for a canyon lying southeast of any properties heretofore described, which is reached by passing the Old Telegraph, and proceeding over the divide which separates the two gulches. Farthest up the canyon is the Northern Chief Mining Co.'s property, including some 20 or more claims in a group. Work is now being prosecuted on the Queen and Old Times. At the Queen we found Mr. A. J. Gauchat, who has a lease on that mine. He employs 15 to 18 men and is taking out a ton or more per day of very fine ore, which runs 95 ounces silver and $8 to $12 gold per ton, the percentage in lead being only about 15 per cent. Mr. Gauchat is an old-time miner on the Pacific Coast, and has had varied experiences. He states that the Queen is opened by drifts along the ore vein for 1,100 feet. A tunnel 300 feet long strikes the vein about that distance below the croppings. The ore is variable, otherwise this would be a phenomenally valuable property.

Mr. G. W. Walter is at work concentrating in a small way at the old Queen dumps, and is making good wages. By screening and washing he obtains slimes that will run 100 ozs. silver to the ton.

The Hyatt, a short distance below the Queen, is now being worked on a lease by Messrs. Cummings Bros. and one or two other parties. The ore in this mine is exceedingly variable, so that careful sorting is necessary. Much has been sent out which runs 300 ozs. silver to the ton, though there are other untold quantities that carry only 15 ozs. to the ton. The parties report that there is plenty of ore in sight, which is reached by a tunnel 540 feet into the hill.

At the Lucky Boy, which is regarded by experts as one of the most promising mines in the locality, we found very little doing at the time of our visit. The decks are being cleared, as it were, for future action. Buildings for steam hoist, pumps, etc., have lately been put up, and the pump is at work to clear the old levels in the mine of water, which it was expected would be accomplished soon. J. H. Morton, Esq., a thoroughly informed and practical man, has charge of the mine. Eighteen to 20 men will be put to work as soon as possible. The ore in the Lucky Boy is reached by a tunnel 1000 feet into the hill, and previous workings have opened lower levels. The tunnel taps the vein at 700 feet from the surface. Mr. Morton thinks the ore taken out would be favorable to treat by lixiviation. Some of it runs very high in silver (730 ozs. to the ton) but, like other ores in the vicinity, is variable and uncertain. We shall look with interest for the returns from this mine after work is really begun.

Smaller Properties.

It would be impossible to mention in detail the many mines which are being worked in a small way in the Bingham district. We could not, during our short visit, inspect more than those described. Down near the railroad depot, we found Chas. W. Watson, Esq., at work with a concentrating apparatus on ore from old Winnemuck dumps. He handles quite a quantity of ore, and gets satisfactory results from what was considered waste in former days.

John Butter has the Winnemuck mine leased. He has three or four helpers, and is doing very well with his enterprise.

H. F. Samson, Esq., like the other gentlemen just named, an experienced worker about mines is doing a little with the old Tiwankee, close to the Winnemuck, and also working the Last Chance. He employes fifteen to twenty men, and in the latter mine, is running a 1,500-foot tunnel, besides prospecting. The present ore product from the Tiwaukee, is fifty tons per month.

Mr. Watson employs fifteen to twenty men on the Nast and Saturn mines, in a canyon to the north of town, where are several other mines which we are unable to report upon. He is taking out 90 to 100 tons of first-class ore per month.

Thus, it will be seen that Bingham Canyon is a tolerably active mining camp, and that its output of ore, although in comparatively small lots, aggregates considerable in bulk. If Utah in 1885 could be blessed with a more active and prosperous season than that just passed, with a corresponding readiness on the part of capital to invest in mining properties, there is no reason why the district above described should not take its rank high among the productive mining localities of Utah and the Pacific Coast.

Ground-Hog Experts.

One of the greatest afflictions that miners and prospectors have to contend with is the so-called, and often self-styled, "experts," who come around our mining camps. These men are generally good talkers, present a pleasing appearance, and very courteous in their manner. They soon convince the public that they can control large capital.

Many of these experts are good miners, and also understand the manipulation of all classes of ore, and are good practical and successful managers of mining property. These, however, are far in the minority. The expert most frequently to be met with is a man sent out by wealthy capitalists, who instruct him to examine a mine, select ore, ascertain the quantity of ore on the dump, the extent of developments, cost of transportation to and from the mine, and all facts pertaining to the matter. They know as well as he that his experience as a miner or manager of mines has been very limited, and no reliance can be placed upon his judgment, but if he only places the facts before them they will be able to judge for themselves. He also reports upon what terms the mine can be bought, and of couse has an opinion to express.

They frequently instruct him to offer a certain price for a mine, or not to exceed a stated sum, allowing him no discretion in regard to closing a bargain.

One method which has been in vogue among the capitalists of San Francisco and Virginia City for several years is a source of great annoyance to miners. A firm will hear of a new and partially developed mine, and will select some favorite who happens to be idle who, although possessed of good business qualifications, is devoid of mining experience, and will send him out to make an examination. His time will be limited; he goes upon the ground and makes a hurried examination; politely tells the owners that their mine is not sufficiently developed to justify a sale at the prices asked, or perhaps informs them that in his opinion they have no mine, nothing but a blossom; nothing that would justify the erection of reduction works. He will talk in a very satisfied manner of the minerals of the country rock; dwell at length upon the disadvantages in working the mine, and, after satisfying himself that he has convinced the community that he is a man of some importance, returns to his principals and makes to them a full, and often favorable report. If they are convinced that the mine is a good one, or that they can handle the stock to good advantage; or, in other words, place the mine in such a shape that the profits to be derived from the investment becomes an uncertainty, thereby creating a gambling scheme, then they will proceed to make the purchase, something after the following manner:

They send another man, a stranger of course, to the owners of the mine, and a man of experience in the management of mines and the manipulation of stocks. This man pretends that he is representing a small firm who would like to put up a mill for an interest in a mine, or will have some project not leading to a direct purchase of the mine. He will so work upon the mine owners that they will make a bargain for a mill, or come down in their price, and often consent to the bonding of the mine to him for a term of six months. This is what his firm have desired; now they are safe. Once bonded to them, although standing in his name, their gambling operations begin and only to cease when the mine passes from all semblance to a mine, or even until its name fades from memory.

The uninitiated may ask, "What is wrong in bonding? Is it not legitimate? Is it not a fair bargain between the owners (party of the first part,) and the cunning stock sharps (party of the second part?)" Yes, it is legitimate so far as custom goes, but these stock jobbers let no opportunity pass where they can turn an honest (?) penny. As soon as their agent, the expert, returns with the bond, the mine becomes noted, a long line of benchmen are sent around to apprise other operators that a bond is on the market, the mine of which is of fabulous richness, and soon inquiries are made regarding the bond. The holders of the bond pretend secrecy at first, finally offer the bond for a sum far in advance of what it calls for, or take in parties to share with them, taking care to hold the controlling interest themselves, and drawing from such parties all the cash they can squeeze out of them. Thus by working for six months on the streets of San Francisco they draw out thousands of dollars from the pockets of the unwary, a portion of which is spent in the partial development of the mine.

As the time arrives for taking up the bond and paying for the mine, they usually ask the owners for more time on the bond. If time is not given they will try various ways by which to hold possession, and as a last resort will declare the mine worthless and leave it in apparent disgust. If they have succeeded in fleecing their city dupes enough to satisfy their greed they will drop the mine for good; otherwise they will send a man to the owner, also a stranger, who will offer about half what the mine is worth, provided the other party fail to take up the bond.

This is only one way out of many which have come under the observation of the writer. Many other plans are adopted by mining sharps in the manipulation of bonded interests, all of which retard the development of mining property and proves an embarrassment to miners and prospectors.

The prejudiced reader may think that this is written by one who has a mine for sale or in the interest of those who have. Such is not the case. It is the wish of the writer to correct an evil that is doing more to retard the development of mines than anything which exists in mining affairs.—*Cor. Calico Print.*

A Mexican Mining City.

Zacatecas is awakening to the fact that the world moves. With one railroad actually here and another in prospect, American stamp mills coming in, and "gringos" (Americans) on every corner, the town wears a surprised aspect, as if wondering if it were really Zacatecas after all. The town—or, perhaps, I might better say city, for it has 60,000 inhabitants—is situated in a little valley, surrounded by three hills, and the houses, for lack of room, are unusually high, some even four and five stories. The streets are paved with a sort of Mexican modification of macadam, though some have a regularly laid cobble-stone pavement. Plazas and churches abound. The stores and warehouses are among the largest and best supplied in the republic, and the bustle reminds one of a Mexican town. Yet, for all this, Zacatecas is a mining camp, one of the oldest in Mexico. It was worked for many years by the Spaniards before the revolution, and work has never entirely ceased. The mines are in the very edge of town, some of them actually extending under the houses. The "haciendas de beneficio," or ore-reducing establishments, are also in the edge of the town, and to an American they afford a curious study. The process of working the ore seems to be about as follows: It is brought from the mine in pieces from the size of an egg to that of an orange, and first taken in hand by the quebrador, breaker, a half-naked Indian, whose chief articles of clothing are a pair of cotton drawers, wider at bottom than top, and a buckskin banging in front of his breast, something after the manner of an apron. The more wealthy among them often boast of a shirt. These quebradores crush the ore to the size of chestnuts, pounding it on top of a flat rock. They use for the purpose a hard peice of flint, keeping the ore in place on their stony anvil with their feet, which are bare. The anvil is even with the ground, and they seat themselves at the same level, and when hard at work, with both hands and feet in motion, they have a comical resemblance to "Brudder Bones" of the minstrels. The ore next goes to the Peruvian mill, a round stone trough, with a smooth flat bottom, about nine inches deep, and six feet across, made out of a single stone. Here a large stone is rolled over it by mule power until the ore is reduced to the size of rice grains, and then it goes to the tahonas or arrastras to be ground in water to an impalpable pulp. A arrastra may be compared to an American wash-tub seven feet across with stone sides and bottom and an upright post in the middle, which serves as a pivot around which a span of mules drag two large stones. The rice-size ore is then thrown into this arrastra with a little water and the stones dragged over it, water being added from time to time until it is reduced to a thin paste, when it is ready for the patio. When taken from the arrastra the ore is put into lameros (drying tanks), where it stays until about as thick as fair, average mud. The patio is a smooth stone floor, varying in size with the capacity of the hacienda—from two to three acres is the average size. Here the process of silver extraction begins. The first step is the casalmero (salting). A pile of mud is formed about ten inches high and from 30 to 70 feet across, over which salt is sprinkled. Horses, mules or oxen are then driven around in it until the mass is well mixed with the salt, and then quicksilver is sprinkled, and after that sulphate of copper or majestral, a crude double sulphate of iron and copper; then more quicksilver, if needed, the pulp being tested after each addition of material. After the operation is complete the pulp is washed and the amalgam separated, very much as in the mill process in the States. The whole process takes about three weeks and costs about eleven dollars a ton.—*Cor. St. Louis Globe Democrat.*

VALUE OF THE BESSEMER PATENTS.—The patents taken out by Sir Henry Bessemer on his improvements in making steel are said to be worth $100,000,000. That is probably the most valuable patent ever taken out in any country, and no other patent ever created a greater revolution in the specialty of manufacture for the improvement of which it was intended.

THE Sierra *Tribune* learns that several mine owners in the northern part of the county have joined issues, and put the dam in Slate creek in shape to hold the debris in durance vile. They have also built a strong and substantial dam about one mile below the old one, in the same stream. Chas. Deasing, of Howland Flat, has charge of the works.

A. D. MCMILLAN, agent for the MASONIC RECORD, recently for a short time in Shasta county, is requested to address this office. He was last heard from in Chico, November 3d.
Fraternal Publishing Co.

Bright Outlook for Mining.

The Southern Utah *Times* says: Now that the great national contest has been decided, the clogs of uncertainty which always interfere with monetary enterprises during a Presidential campaign, have been removed. That there will be a revival in mining operations in the near future, we have no doubt. There are millions of dollars lying idle in the vaults of Eastern capitalists waiting proper investment. The mining business is better understood and more appreciated at the present day than ever before. We do not expect to see the days of Virginia City and Leadville, with their wild speculations in the rise and fall of mining stock, when fortunes were made and lost in a day, revived, but we do expect to see a revival in mining affairs as a legitimate business, where capitalists will make careful investments in gold and silver mines with the expectation of getting a fair return on their invested capital. On account of the many wild-cat schemes which have originated in the Rocky and Sierra Nevada mountains during the past decade, Eastern capitalists have looked with a suspicious eye on everything relating to gold and silver mining. The day is past when the "speculator," with his mines, tunnels, shafts and ore piles, "on paper," can dupe the Eastern man of money.

The shafts and drifts must be in the ground, and the ore in the mine. The man who buys a mine nowadays, examines the property personally or sends a trusted agent to act for him. A specimen with an assayer's certificate does not satisfy the purchaser as to the quality of the ore, but a sample from the ledge, assayed by his own assayer, is what our present day buyer will have. The days of White Pine excitement have gone forever. The occupation of the old style prospector is gone. He will tell you of the good old times when he sold a hole in the ground over in Nevada for a fortune. He will tell of the time he received two and three hundred dollars a month, expenses and horses furnished by a California company, for prospecting and making locations. All that was required of him was to ride over the country, find a ledge, write location notices and build little stone monuments on the corners of the claims. Poor fellow, he has been useful in his day; he has made trails through the wilderness, and pointed out localities in our wild mountain ranges where the precious metals are hidden, but, like the old placer miner, he will soon be a character in our past history. The prospector of the future has different duties to perform. He must not only find his ledge, but he must also "stay with it" and, by the judicious use of pick and drill, show up an ore body that will pay to work. The sooner our prospector will adapt himself to this new order of things the better it will be for him. While this changed state of affairs will sound the death knell of the mining stock speculator and old prospector, it will be an era of light for all citizens who desire to see our mineral country developed, and our mining operations placed on an equal footing with the legitimate industries of our country.

Utah Mining Maps.

While in Salt Lake City our correspondent had the pleasure of making the acquaintance of Col. B. A. M. Froiseth, of that city, who was for many years connected with the Surveyor General's Office and the public surveys in Utah. The Colonel, who is the pioneer map publisher of Utah, has published several maps of the Territory and of the mining districts, which have always given general satisfaction and been recognized as the most reliable and authoritative. He has now under progress of rapid completion two very important maps, which will soon be published. One is a map of the whole Territory, drawn to a scale of eight miles to one inch, that will furnish at a glance the full and complete geography of the country, and will possess every feature that goes to make a map valuable. The other is a new mining map, (of the heart of Utah) drawn to a scale of four miles to one inch, which will show the location and boundaries of some thirty organized mining districts adjacent to Salt Lake City, also the location of a few of the best known mines in some of these districts, the county boundaries, railroads completed and under construction, and general topography of the country embraced within the area shown on the map. We are confident in saying, that this map will be a complete guide for operators in mines, as well as business men and prospectors. Further information may be had of the publisher.

EASTERN MANAGEMENT.—The time given the Columbus Company by Mr. Barnes on the Manitou group has expired by limitation. Here we have, says the *Bonanza Enterprise*, a sample of mining by Eastern syndicates. After spending an immense amount of capital in running a 700-foot tunnel, they cut one of their lodes and explored it, all of 700 feet in each direction from the point of intersection. It was a foolish undertaking in the first place to run a long tunnel for lodes that had not developed sufficiently to show value, and it is now the acme of foolishness to abandon a property that has cost so much, without ascertaining by the expenditure of a few extra dollars the value of the lode cut.

Danger From Friction Matches—A Proposed Remedy.

The ordinary friction match is probably one of the most prolific sources of "mysterious fires." These dangerous and indispensable conveniences are found in every household, and in almost every man's pocket. They are too often scattered about where they may easily be reached by rats and mice, and even very young children. Fires are often produced by mice and rats nibbling at them. They take them into their nests; they drop them between the ceiling and weather boards. They are often found among papers thrown into the waste basket, and into places where they are liable to be trampled on and fired at an unexpected moment, and perhaps without being noticed. They get into cotton bales and set fire to cotton mills while being run through the picker.

But there are friction matches which will not ignite unless rubbed upon prepared surfaces, and the question has been asked, why not encourage the use of such by putting a heavy discriminating tax on all others, and allow the "safety matches" to go free? Such a law, if it could be made universal, would no doubt prove a vast saving to the country. With such a law, "mysterious fires" would be much less frequent, and others more rare. Ordinary friction matches, especially such as were denominated "parlor matches," are regarded with much disapproval by many persons, and numerous housekeepers and business men are discarding them for the "safety match."

So much valuable property is destroyed every year by the dangerous friction match, that the subject of prevention is becoming a matter for serious consideration. As insurance companies are the greatest and most direct sufferers, they are the parties that should take the initiative in the matter. No doubt a concerted movement would receive a favorable attention from our State legislators, if not from Congress itself, whose jurisdiction might possibly be made to cover the case of a competitive as well as of a general tax.

THE DECLINE IN FINE SILVER.—A London cable reports fine silver at 49¾d per ounce for the English standard, which is 956. This is the first time that silver has been below 50d in many months. About eight years ago it fell temporarily to 46½d, the lowest in at least 50 years. The price soon recovered from that extraordinary low point, and has been 50d and upwards for most of the time since. The cause of the present decline in the metal is the dull condition of the world's trade. The political disturbances in China have thrown matters out of gear in that country. The shipments of fine silver hence to Hongkong for the first ten months of the current year were unusually large. Some of these consignments were sent out on speculation, or as means to cover. Finding no sale in Hongkong, at least one or more invoices were ordered to Shanghai, but with no better result, and subsequently sent back to Hongkong, where the silver remains unsold. As a result of this depression in China, not an ounce of fine silver was shipped by the steamer on the 11th. Silver is suffering from a dearth of demand, rather than from any over supply. The fact is, the product is not so large as it has been.

A SUPPOSED CAUSE OF DUST EXPLOSIONS.—Herr Baehr, lightning inspector of Dresden, contributes some notes on the above subject, which, in view of the recent explosion of malt dust at Bass's brewery, London, will perhaps be of interest. The writer states that the leather mill bands are known to be a source of electricity, and from experiments he has lately conducted with the belts used for producing the power for the electric lighting of the Royal theater at Dresden, he is convinced that the electricity produced by the belts may now and then be the cause of the spontaneous firing of malt or flour dust, because in almost every case the electricity is absorbed in the various parts of the machinery. He recommends that care should be taken to see that no metal part is connected with the driving belt, if there are dangerous materials near, such as malt or flour dust.

THE COMMERCE OF CHICAGO.—The arrival and clearances of vessels at the port of Chicago are much larger in numbers than at the port of New York. A great many people, when told this fact, appear incredulous, and yet it is strictly true. Of course the vessels here are smaller, as a rule, but the aggregate of the tonnage arriving and clearing at this port is greater than the tonnage at New York. The total of clearances for the month of May last was 547,868 tons. The lake commerce of Chicago is growing from year to year, and its future is destined to be a most grand one.

ASSESSMENT WORK.—Owners should remember that the time for the performance of the annual labor necessary to hold unpatented mining ground is slipping away; and hence, mine owners who cannot personally attend to such work on their properties cannot be too careful in the selection of their agents. A great deal of trouble has been created by unfaithful agents, who, while receiving the necessary $100, would expend a trifle, pocket the balance, and thus endanger the ownership of their employers. The certificate of a dishonest agent will not hold against the actual performance of a relocation,

ENGINEERING NOTES.

Some Useful Notes for Engineers.

Among the questions most frequently asked of our inspectors when making their ordinary visits, says the *Locomotive*, are the following, which are of such general interest to engineers as to warrant publication:

1st. How much water per pound of coal should be made into steam at 60 pounds pressure per square inch with 60 inch tubular boilers properly made, well set, and carefully fired?

Under the above conditions, from 8 to 10 pounds, dependent somewhat, of course, upon the quality of the coal and the temperature of the feed water.

2d. How much more coal per pound of water does it take to carry 80 pounds per square inch than it does to carry 60 pounds per square inch?

This question could with more propriety be put as follows: How much more heat does it take to make a pound of steam at 80 pounds pressure per square inch than it does to make a pound at 60 pounds per square inch?

Practically, no more coal will be required; theoretically, about 0.4 of one per cent, or about 1-250 part more.

3d. Do you get enough better results from steam of 80 pounds per square inch than you do from steam 60 pounds per square inch to pay the extra wear and tear of boiler and engine?

Depends entirely upon conditions. If you can make use of steam of 80 pounds pressure, it pays to use it; there are conditions, however, where 60 pounds, or even less, would be decidedly more economical.

4th. How much more heat do you get from pipes carrying 60 pounds pressure than from pipes carrying 10 pounds pressure?

Two and one-tenth per cent more heat will be given out per pound condensed from steam of 60 pounds pressure than from steam of 10 pounds pressure, in falling from temperature due to the respective pressures of to 212° Fahr.

5th. What proportion of direct heating surface to the volume of a fairly protected room is required to maintain the temperature of the room at 60° Fahr. in buildings heated by steam?

From 1-75 to 1-250, according to size and exposure of room.

6th. How much is a given amount of steam reduced in bulk by compressing it from 60 pounds per square inch to 80 pounds per square inch?

About 20 per cent. See any steam table.

THE SHIP CANAL ACROSS IRELAND.—The ship canal across Ireland is attracting serious attention. The *Freeman's Journal* has published particulars of the project, which it assures its readers is a reality, and has been warmly espoused by influential Englishmen. Elaborate plans and surveys have been made, at considerable expense, and have been submitted by Captain Eads, the American engineer. The proposed canal would be 127 miles in length, and would contain 30 locks. For ships of 1,500 tons the cost would be £8,000,000; for ships of 2,500 tons, £12,000,000; and for ships of 5,000 tons and upwards, £20,000,000. If built on this scale, the canal would be 200 feet wide on the surface and 100 feet at the bottom. The passage through the canal would be effected by a system of towage, and it is estimated that the passage of a ship from Galway bay to Kingstown would occupy between 24 and 36 hours. An alternate scheme of ship railway, on which the ships would be carried in cradles, which could be constructed for £10,000,000, is proposed, by which the duration of the passage through the island would be reduced to 12 hours. An immense aqueduct would have to be constructed to carry the canal over the Shannon at Banoque. It would be over three miles in length, and would be one of the most difficult and costly works in connection with the undertaking.

TO TEST THE VIBRATION OF BRIDGES.—The *Ohio State Journal* says that Mr. Fred Marvin, a graduate of the Ohio State University, has just completed, under the direction of Prof. Robinson, an instrument for testing the lateral and vertical vibrations of bridges while trains are passing over them. The "indicator" consists of a cylinder run by clock-work, a strip of white paper wrapped around the cylinder, and two pencils whose points touch the paper as the cylinder moves. The machine is fastened to a board 20 inches long by a foot wide, which is clamped to a beam. When there is no train on the bridge the pencils register straight lines as the cylinder moves; but as soon as a train strikes the bridge, the vibrations, both longitudinal and transverse, are recorded. It is proposed by this machine to determine the safety rate of travel over a bridge, both for long and short and heavy and light trains.

RAILROADS IN JAPAN.—Japan has at present 155 miles of railroad—from Yokobama to Tokio, 18 miles; Kobe to Otsu, 58 miles, Tsongara, in the province of Oomi, to Sekigahara, in the province of Mino, 41 miles; and Tokio to Koumagai, 38 miles. There is, besides, in course of construction, a road to unite Maye-bashi to Tokio, a distance of 81 miles.

THE FATHER OF WATERS.—The Mississippi river and its tributary streams furnish 16,571 miles of steamboat navigation, and 20,221 miles of barge navigation, divided between 22 States and Territories. A father of waters indeed.

USEFUL INFORMATION.

Unburnt Brick.

Much as many may dispute the fact, it is nevertheless true that unburnt brick form a much drier wall than ordinary burnt brick, inasmuch as they are not so absorbent of wet or damp. To make these any ordinary clay will answer. If dry when obtained, it must first be moistened and thoroughly worked by the feet of cattle, or pounded by hand. Cut some straw into pieces about six inches in length. After being duly mixed with the straw the clay is ready to be made into bricks. A mould of any size may be made; this mould should have a bottom, but not air-tight, in order to prevent the brick from sticking in the mould. The clay is put into this mould and the brick formed much in the same way as ordinary brick. Should the clay be very tenacious, a little sand sprinkled in the mould will enable the brick to leave it freely. The bricks are placed on level ground to dry, turning them on their edges on the second day; thereafter left in piles, protected from the rain, for ten to twelve days.—*Burn.*

SAWDUST TO PREVENT SCALE.—A St. Louis journal says: "A number of our technical exchanges have simultaneously hit upon a 'new discovery,' namely, the utilization of oak sawdust as a preventive of scale formation in boilers. The 'discovery' is about as new as sawdust. From a period when the memory of man runneth not back to the contrary, backwoods engineers have been more or less given to throwing a stick of oak cordwood into their boilers to prevent scale from forming. For four years, under the writer's own observation, a manufacturing company in this city have been using condemned felloes and sawdust in their boilers, generally the former, however, on account of the nearness of a wheel factory. The results are very satisfactory, for while the boilers required cleaning every two weeks before the company began using the wood, they are now cleaned once in two or three months. The sawdust, if used, is tied up in a bag and dropped into the boiler; the felloes are thrown in to the number of two or three.

HOT FITTING HORSESHOES.—A correspondent of the *Blacksmith and Wheelwright* says that fitting horseshoes while very hot is a barbarous practice; it draws the oil and moisture from the foot and leaves it crisp and brittle. I have seen smiths hold a red-hot shoe on a foot until it has been fried like a steak.. Why is this done? Because they are too lazy to use the knife and rasp. A smith is justified in heating a shoe hot enough to make an impression on the foot, but no hotter, and a smith who cannot fit a shoe in this way ought to leave the business. I do not think that any rules from books can be of much use to shoers, because a style of shoeing that will answer well for one horse may not do at all for the next. I think horseshoeing requires more study than any other part of the smith's trade. In this connection we would refer the reader to an article in another column under the head of "Barefooted Horses."

FLOATING BRICK.—Floating brick were made before the time of Strabo, and commended by Pliny, and in 1791 they were brought into notice in Tuscany. They are made of a very light silicious earth, and clay is sometimes added to bind the material together. They can be made so light that they will float on water, and their strength is almost equal to ordinary bricks. They are remarkable for infusibility, and for being very poor conductors of heat. They may be held by one end while the other is red hot. A Tuscan named Fabroni built the powder magazine of a wooden ship with these bricks, and the vessel was set on fire and burned, not only to the water's edge, but until she sank, without explosion of the powder. The clay of which these bricks are made contains immense numbers of microscopic silicious shells of infusoria. It is found in France and Prussia.—*Brick and Tile Review.*

A NEW USE FOR ELECTRICITY.—The *Miller's Gazette*, of London, England, says: The electric light has, during the past month, been successfully applied to the lighting of a baker's oven, the first instance of such an application of electricity. A great difficulty has always existed among bakers to get a light into their dark ovens, so that the progress of baking might be observed. This application, under the direction of W. D. Gooch, of placing two incandescent lamps, driven by a Victoria Brush machine, inside an oven, where the temperature ranges from 400° to 600° F., is therefore a notable advance. The oven in which this invention can be seen is that of Perkins & Sons, and worked by Harris & Co., of "Angels' Cake" fame. The oven door contains a sheet of plate glass, through which the whole of the oven is distinctly visible. The baker now never need burn his bread or pastry.

THE TOPS OF CHIMNEY STACKS need careful arrangement because the exit of smoke from them is very liable to be disturbed and hindered by gusts of wind; particularly when beneath other high objects in the neighborhood. There should be at the top of every flue an expanded space, within which most down draughts of air will rotate, and expend their force, without invading the flue below; and there should be louvred openings, so arranged as to direct the wind upwards, and make it assist, instead of interfering with, or retard the exit of the smoke.—*The Architect.*

TO SOFTEN A PAINT BRUSH.—When a paint brush is still and hard through drying with paint on it, put some turpentine in a shallow dish and set it on fire. Let it burn for a minute until hot, then smother the flame and work the pencil in the fingers, dipping it frequently into hot spirits. Rinse all paint brushes, pencils, etc., in turpentine, grease with a mixture of sweet oil and tallow to prevent them from drying hard, and put away in a box out of the dust.

BRASS WORK that is so dirty by smoke and heat, as not to be cleaned with oxalic acid, should be thoroughly washed and scrubbed with soda, or potash water or lye. Then dip in a mixture of equal parts of nitric acid, sulphuric acid and water, or if it cannot be conveniently dipped, make a swab of a small piece of woolen cloth upon the end of a stick and rub the solution over the dirty or smoky parts; leave the acid on for a moment, then wash, clean and polish.

INDIAN INK.—Indian or Chinese ink, an article much used by draftsmen and others, is made essentially of lampblack, formed into cakes by means of some glutinous or adhesive substance, such as gum water. The lampblack is said to be made in China, by collecting the smoke of the oil of sesami. A good Indian ink is made with ivory black, ground to a fine powder, made into a paste with arak gum Arabic water, and then formed into cakes.

DEPOPULATION OF IRELAND.—The depopulation of this unhappy country is still going on. According to the annual report of the Registrar General of the marriages, births and deaths in Ireland, for 1883, which has just been issued, there was a decrease of 86,789 in the population during the year. The marriages and births are under the annual average for the preceding 10 years.

GLASS SHEATHING FOR SHIPS' HULLS.—*Popular Science Monthly* claims that an Italian ship has been sheathed with glass plates, cast like iron, so as to fit the hull, to take the place of copper sheathings. A water-proof mastic is used for jointing the plates. The advantages claimed for the new material are insensibility to oxidation, and exemption from incrustation.

ARCTIC MUSIC.—One of the greatest curiosities in the arctic regions is the music which the traveler has with him wherever he goes. The moisture exhaled from his body is at once condensed and frozen, and falls to the ground in the form of hard spikes of crystals, which keep up a constant and not unpleasant clatter.

EARTHQUAKES IN GREAT BRITAIN.—Statistics published since the late earthquake in England show that a total of 255 shocks have been recorded in the British Isles, the severest having occurred November 14, 1318.

GOOD HEALTH.

Cure for Rattlesnake Poison.

Charles M. Purdy is one of the leading commission merchants in New York who handle the fruit products of the Hudson valley. Mr. Purdy's residence is near Marlborough. About 80 years ago Mr. Purdy's mother, then a young woman, while rambling along the banks of the Hudson, on what is now the Thomas T. Buckley estate, was bitten by a rattlesnake on the leg. The poison caused great pain and the limb was discolored very much, and the old settlers said that the only thing to do was to mount a fast horse and ride to the Marlborough mountain and coax an old Indian woman, who lived there all alone in a cave, to come and cure her. This was done and the life of Mrs. Purdy was saved through the medicine furnished by this old squaw. It is a simple remedy—a small cupful of the juice of the plantain weed, which is to be found along every road and in nearly every dooryard in the country.

Mrs. Purdy gave these facts to the New York *Times'* correspondent for publication not long since, expressing the hope that inasmuch as the plantain juice undoubtedly saved the life of Mr. Purdy's mother the same service might be made available to others if publicity was given to the facts.

Inquiry made among farmers and country people generally elicited the information that plantain weed is used extensively for poultcing to heal up running sores and to break up cases of chills and fever. Dr. A. H. Palmer, of Marlborough, says that a handful of plantain leaves made into a cup of tea breaks up severe attacks of certain malarial disorders when other specifics fail. Old inhabitants say plantain leaves years ago were considered a sure cure for hydrophobia. Wood-choppers on the Plattekill, Marlborough and Shawangunk mountains say they have long known that plantain juice would prevent fatal results from the bite of a rattlesnake. Toads and other animals know the medicinal properties of the plantain weed. When bitten by a snake they invariably hop to where the specific can be had.

HAIR DYE FROM WALNUT SHELLS.—Express the juice of the bark or shell of green walnuts. To preserve this juice a little rectified spirit is commonly added with a few bruised cloves, and the whole digested together with occasional agitation for a week or fortnight, when the clear portion is decanted, and if necessary filtered. The dye will stain the scalp or any other textile substance it may come in contact with. To apply it the hair is first thoroughly cleansed with sal soda, and the liquid applied same as any hair wash. An ordinary washing of the hair with the liquid ought to suffice, but in some instances several repetitions are necessary. As to the frequency of the application this can only be determined by watching the results.

Poisonous Solder in Canned Goods.

The frequent cases of poisoning, from eating canned goods, has of late drawn much attention to that subject. The poisoning was at first thought to proceed almost entirely from decomposition of the goods themselves; but more thorough investigation points to the character of the solder used, as the principal cause of poisoning. A Brooklyn, N. Y., physician, has been making examination to discover the reason, and he finds that in many cases it was customary to fasten on the cap at the top of the can with an amalgam of muriate of zinc; that this amalgam was put on with brushes by boys, and the soldering iron then passed around it; that nothing was easier than for some of this muriate of zinc to get inside of the can; and that when there it must become absorbed in the contents, and render the latter extremely poisonous, since a muriate of tin was added to the muriate of zinc, by the action of the acid wherever it entered the can. Canning establishments should discard this method of sealing the cans at once, or people will soon cease purchasing the canned provisions. No considerations of cheapness or convenience can prevail against the higher law of health, at least among intelligent and prudent consumers.

A paper recently read before the New York Medico-Legal Society, in regard to six cases of poisoning in New York City, concludes as follows:

1. These were not cases of sickness from spoiled goods.
2. They were cases of corrosive poisoning from muriate of zinc and tin.
3. This poisonous amalgam must be abandoned as dangerous to human life.
4. Reject every article of canned food that does not show the line of resin around the edge of the solder on the cap, the same as is seen on the seam at the side of the can.
5. Reject all goods that do not have the name of some wholesale firm on the label.
6. A "swell" or decomposing can of goods can always be detected by pressing in the bottom of the can. A sound can, pressed, will give a solid feel. When gas from the decomposition of the food is inside the can, the tin will rattle by pressing up the bottom as you displace the gas in the can.
7. Reject every can that shows any rust around the cap on the inside of the head of the can.

Fruit Acids.

A correspondent of the Germantown *Telegraph*, Penn., writes from St. Helena, in this State, as follows:

In your issue of September 17th, an article on the bad results of eating strawberries is printed, which is certainly based on facts. Many persons who may digest even the strongest spices, or eat meat with the most pungent savoring on it, are disagreeably affected by acids, and even a light, diluted wine, ever so little alcohol forming part of it, will not agree with them; that is, the fruit acids of the same affect some of the tissues of such exceptionally constituted persons. While the acids of apples agree with them, those of plums or cherries disagree. The same may be the case with the very rare percentage of people who complain of the disagreement of the splendid acids of strawberries. But probably the cause lies deeper. Do not most people enjoy the consumption of cream along with strawberries? Then has it ever occurred to many that such heterogeneous substances as fruit acids and cream combined entering the stomach will not exactly have a favorable effect? Will not many of the delicious-tasting sweetened fruit compounds united with cream cause disturbances similar to strawberries with cream? It seems certainly more reasonable to heighten the flavor, particularly of strawberries, sugared, with just a teaspoonful of white, light wine such as Riesling, dosing moderately, very moderately, as people do on the European continent, who are astonished at the bravery of the English who try to assimilate the milk product with the pleasant acids of a plant.

A CURE FOR HICCOUGHS.—A remedy, tested many times without a failure, is published in the *Popular Science Monthly*, which says that it can always be used by some one else upon a person who has "the hiccoughs," and generally by the sufferer himself. You say to your friend something like this: "See how close together you can hold the tips of your forefinger without touching. Now keep your elbows out free from your side. You can get your fingers closer than that. They are touching now. There—now hold them so. Steady!" By this time you can generally ask, "Now why don't you hiccough?" The involuntary tendency to breathe slowly and steadily when the attention is fixed on performing a delicate manipulation counteracts the convulsive action of the diaphragm."

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

MIDDLE BAR TUNNEL.—*Ledger*, Nov. 15: The big tunnel at Middle Bar has reached a distance of about 1600 ft. The face is still white, barren quartz. It is believed that the gold-bearing ledge lies beyond. The progress of the tunnel is necessarily slower as the distance increases.

MAMMOTH.—The clean-up at the 10-stamp mill was made last week. One hundred tons were put through, which yield an average of $27 per ton. The very rich ore was worked separately by hand mortar, and crushed dry. Some of it was immensely rich. The Mammoth maintains its reputation as the champion free gold mine of the county.

LAMBING GRAVEL CLAIM.—Our report on the Lambing gravel mine in last week's issue, was slightly in error in some respects. The main body of the car is 42x16 ft, the mast is 42 ft high; the hoom is 114 ft long. The buckets, or boxes, hold 3 cubic yards of earth, and will dump one every 1½ minutes. The derrick is put up for the purpose of stripping off the top dirt, so as to enable the washing of the rich pay dirt in the pit. The derrick is working splendidly. All persons interested in placer mining would do well to call and see the derrick at work.

MISCELLANEOUS.—A contract for running 100 ft from the upraise at the Amador Queen mine in Hunt's gulch, was let this week, to George Thomas.

Calaveras.

MINING ENTERPRISES. — Calaveras *Chronicle*, Nov. 14: For some time there has been a dearth of mining news in this vicinity. In fact, matters in this line of business have been at a standstill. In most of the claims operations were partially and in others wholly suspended for a time. It is said that there is always a calm before a storm and it is certainly a fact that there has been quite a calm in mining operations which cannot at all be attributable with any degree of reason to the interest which a Presidential campaign involves. While we are not prepared by any means to announce that a regular storm has succeeded a calm in the mining industry, we do mean to say, however, that there is evidence of awakening from the dormant state into which the business had fallen and renewed activity is manifesting itself in gravel mining. It seems that hopes are yet entertained that the old channels which have yielded vast amounts of auriferous wealth, have not been entirely exhausted, and that treasures still lie imbedded in their depths to reward the labors of enterprise and perseverance. The difficulties of further conducting operations on the hydraulic plan in the Mammoth mine on Tunnel ridge, on account of the character, quantity and unprofitablenesss of the surface ground, had become such that a change of method was desirable. Accordingly, a gravel mill is to be erected upon the mine, material for which has been ordered and will be on the ground so that construction can be commenced in a few days. Messrs. Schmidt and Phillips of Stockton have engaged in the enterprise with Mr. J. F. Vieth, the former sole proprietor of the mine, and the operations will be conducted under the ownership of Vieth & Co. The mine will be worked in the future by the drifting plan and the gravel submitted to a milling process, the indurated nature of the gravel necessitating such a method. At the Gleeson mine, in Chili gulch, after a suspension of operations, have commenced a new incline tunnel which will be some 1500 ft in length when it reaches bedrock. About 500 ft of the distance is already run. At the same time the water is being pumped out of the old works. A new company has taken the old "What Cheer" mine in hand. The hoisting works and mill of the Empire mine in Old Woman's gulch, has been purchased and moved to the What Cheer. The hoisting works are now in operation getting the mine clear of water. The operations are under the management of Mr. Edward Rigney. Work is steadily continued in the Duryea mine, in Chili gulch. The mill is kept in operation day and night. The Green Mountain claim has kept busily at work without stoppage for months and is paying higher dividends than ever. The property is now owned by McSorley & Co. Report says that it is contemplated to put up a gravel mill on the Kremer mine in Poor Man's gulch. The Bonanza hydraulic on Tunnel ridge, owned by S. S. Moser & Co., is in active operations and paying well.

Humboldt.

NEW RIVER MINES.—Humboldt *Standard*, Nov. 15: The business people of Eureka in particular, and the citizens of Humboldt county generally, owe it to themselves to take active steps toward securing the trade of the mining camp to be opened up in the New River country. If the matter of making a road from Eureka to that section is not actively pushed now, there is every reason to believe that Weaverville and the railroad people will be ahead of us and divert passenger and freight traffic in that direction. Few of our business men as yet realize the magnitude of the development promised at New River and the mining section immediately surrounding it. Mr. Westcott, of Nevada, and Mr. Crossman, of San Francisco, both mining engineers, and experts of established reputation, have recently made extensive and critical examination of the New River country and both agree as to the richness and extent of the mining field to be developed. It is the opinion of many men of good judgment and clear heads that there will be 5,000 people at New River by May next, and more excitable persons say it will reach 15,000. There is no question but that an immense amount of traffic will ensue, and by proper concentrated effort, it can be secured to the business men of Eureka. We hope prompt action will be taken and effective work accomplished to secure this additional element of prosperity to our people.

Inyo.

ORE SHIPMENT.—Inyo *Independent*, Nov. 15: A trial shipment of three tons of ore was made from the Kearsarge mine this week. The ore was sent to San Francisco.

MILL STARTED.—The mill at Snow's canyon was started up last week. Mr. Eddy has a good stock of ore ready and expects to keep the mill running steadily for a long time.

A PROMISING CAMP.—Recent developments in the Sylvania claims, Deep Springs district, are very promising. Several mines now being prospected are showing good bodies of ore. This is a new camp, not formerly heard of outside of the district.

Mono.

NOONDAY TAILINGS.—Bodie *Free Press*, Nov. 11: A *Free Press* reporter yesterday paid a visit to the works which have been erected on Booker Flat to test the feasibility of working the Noonday tailings by leaching. All that the curious visitor can see is a series of large wooden vats or tanks, an engine and pump. The process is very simple, and was thus described by Louis Moore, the gentleman in charge: In the first tank the tailings are subjected to the action of chlorine gas, which, in combination with a solution of lime, converts the metals into chlorides. The solution is then drained into a second tank, where the iron is precipitated. From here it is run into a third tank, where the gold and silver is allowed to settle, and the clear solution is pumped back to the first tank. The settlings in the third tank are then filtered and the sediment thus obtained runs into bars. This process occupies about 48 hours. The first clean-up was very satisfactory. It showed that the process will work the tailings up to 98 per cent of the assay value, which is from $7 to $8 per ton, about half gold and half silver. The Noonday Company is paid 50 cents per ton for the tailings, and the cost of working them is $3.50 per ton, which leaves a fair profit. The present works were erected merely as an experiment, and their capacity is only five tons per day. Having proved the process to be a successful one, the proprietors of the enterprise will at once commence the erection of works with a capacity of forty tons per day. The gentlemen interested in the enterprise are J. D. Miner, George Courtnage and L. Moore.

STANDARD CON.—*Bodie Free Press*, Nov. 17: Extracted and shipped to the mill 558 tons of ore and 700 tons of tailings. Received from the ore 615 ounces of crude bullion, and from the tailings 247 ounces. Shipped to the company, $10,659.62, of which $7,718.39 is from two weeks' run on ore, and $2,941.23 from two weeks' run on tailings. There was considerable decrease in the value of the ore stoped during the past week. It is gradually getting lower grade and now leaves very little margin for profit.

BODIE CON.—During the past week 166 tons of ore were worked at the mill, the average assay value being $205.87 per ton, 12 per cent being lost in the tailings. These tailings are being carefully saved. The ore breasts are looking well. Forty-two men are employed.

MONO.—The drift from the Mono winze, 52 ft below the 600 level, has been extended during the week 12 feet; total length, 32 feet. The ledge is solid in the face of the drift and has good ore in it. Seven miners and one engineer employed.

BULWER CON.—Upraise from south drift No. 3 gained 14 ft; total hight, 164 ft, where the vein is 1½ ft wide.

Nevada.

PEABODY MINE.—*Foothill Tidings*, Nov. 14: This mine continues to turn out extraordinarily rich ore. Superintendent Bennallack seems to have hold of Aladdin's lamp and by its means to command the ledge to turn out gold. The Peabody is close to Gold Hill, where gold in quartz was first found in this State. The Peabody is on the old Gold Hill ledge, we believe. The richness of the mine is wonderful, and appearances indicate that it will keep up its paying qualities for an indefinite time.

REPORTED RICH STRIKE.—It is stated that while the workmen were excavating ground for the mill at Cross & Simond's mine near Downieville, Sierra county, they struck a small ledge of immense richness. The rock, what little there was of it, hung together with threads of pure gold. Our informant says that they will take out a number of thousands of dollars from this new ledge.

MINE BONDED.—Nevada *Transcript*, Nov. 16: Dr. Von Buelow has bonded to J. H. Gillenwaters, agent for a Boston company, the Buclow Con. quartz claim near Newtown in this county. The property embraces 7,500 linear feet, and there are two ledges both of which have been well prospected and give every indication of being valuable. There is on the ground the machinery for a ten-stamp mill, and it will be erected as soon as possible.

A GOOD MINE.—*Transcript*, Nov. 15: A gentleman who recently visited the Yuba mine, a few miles above the town of Washington, gives the *Transcript* some interesting items about that valuable property. It had been operated off and on with varying success for 15 years, till two years or more ago, when George Hearst, Geo. E. Webber and J. B. Haggin, well-known San Franciscans, came into possession, and with George A. Hare as Superintendent, began its systematic development. It has been carefully and intelligently conducted, and has taken rank as one of the permanent and well-paying mines of the State. At present over 40 men, including 10 or 12 Chinamen, are employed. Drifting is being done on the 200 ft level south, the vein being from 4 to 6 ft thick, and all milling ore. An upraise is being made on the vein above the level of the tunnel, and is now up about 70 ft, with good ore showing all the way. The 15-stamp mill, which is run by water-power, crushes from 30 to 35 tons of ore a day, the machinery being more powerful than is usually used. Ore that mills $5 a ton is believed to pay well for extracting and crushing, from the fact that none of even that low-grade is passed by or put on the waste dump.

GOOD PROSPECTS.—The Bishop drift claim, half a mile southeast of the Derbec mine, is panning out well, an encouraging looking body of gravel having been developed recently by cross-cutting. Judge Bishop, who is an owner in the property, says he expects to be realizing good dividends from it when a little more ground has been opened up. He is also engaged with others in prospecting a piece of ground between the Eureka Lake and Malakoff ditches, it being believed that the old Snow Point lead traverses that section. Two shifts of men are employed in running a tunnel at the latter place, and it will not take long to determine as to the correctness of the belief.

Plumas.

INDIAN VALLEY.—Greenville *Bulletin*, Nov. 15: The water is out of the Indian Valley mine and obstacles removed. The removal of the water was effected within the time expected by the contractors. This quick work shows the value of good management and the employment of men who understood their business. It is to be hoped that all legal complications are removed, for it is a pity that a property so valuable should be involved in legal difficulties so as to prevent its operation. It is one of the best mines in this part of the State.

LUCKY S.—The Lucky S mill is running and producing good returns. There was some trouble with the quicksilver "flouring," but that has been remedied, and now the amalgamation is satisfactory. The Lucky S is considered one of the paying mines of Plumas.

FOREST KING.—Work on the lower tunnel is progressing and the ledge will soon be reached. This is a promising mine and one which poor men can operate themselves on a small scale. With a proper amount of capital invested, an extensive mine could be developed. Its location for cheap milling is most fortunate. The owners have already made a large profit.

San Bernardino.

THE SUE MINE.—Calico *Print*, Nov. 15: Work is progressing on the Sue mine in five places. The shaft on the north end is down 40 feet, from which ore is being taken out but not so rich as nearer the top, yet there is an abundance of good, paying ore in sight. The earth is quite damp at the bottom of the shaft, the indications being that they are about to strike a rich "pocket of water" instead of ore. The water, no doubt, is a part of last year's rain. On the south end of the mine an exceedingly rich strike was made in one of the openings a few days ago. Although the rich ore lies in bunches, yet there are large quantities of low-grade ore in sight, ranging from $40 to $75 per ton. This portion of the mine is rugged and precipitous—the canyon being 400 or 500 feet deep. A narrow tramway some 400 feet long, extends from the works on the bluff to the canyon below. The lower fall requires a 75 foot ladder, almost vertical, to reach the bottom of the canyon. For a considerable distance the walls of the canyon are nearly perpendicular, and the gorge is quite narrow. In the near future buildings will be erected to take the place of tents now used for boarding and lodging. Prospecting on the mine will be prosecuted as rapidly as possible, and the extent of operations will depend, of course, upon the nature of the developments resulting from the same. Dr. Evans will remain at the mine and assist in the management. The several companies of chlorider on the Blackfoot and Sam Houston, No. 3 mines are doing well on an average. Every few days some one strikes a rich pocket of ore which nets them handsome returns. The new shaft on the Sam Houston is down 70 feet, and the indications are good for striking a rich body of ore. About 10 tons of ore have been recently taken to Barber's mill for reduction. Geo. Niemeyer and N. Bartholomew have started leaching works near Daggett. They have begun on a small scale and their experiments have so far been successful. They are now preparing to leach five tons of ore per day, but before long expect to put up 20-ton tanks. They have purchased 1,000 tons of Humbug ore which they will commence to reduce shortly.

KRAMER ITEMS.—Our gold ledge looks fine. We have recently struck a pocket which contains ore that will assay way up in the hundreds of dollars. Mr. Kilgore to-day found some very rich ore in the Belden mine. Mr. Pallet arrived here on Monday. Messrs. Hewett and Campbell will be here on the 20th inst., and will assist in forming a new mining district here.

Sierra.

THE MARGUERITE MINE.—Truckee *Republican*: Mr. Meyers, superintendent of the Marguerite mine, at Sierra City, passed through here last evening on his way to San Francisco. The prospects of the mine are all that could be desired; they expect to be in successful operation about the first of the month. Their power for running the machinery is a new invention, or rather a new application of an old one of which they want nothing said at present.

GETTING READY.—Sierra *Tribune*, Nov. 15: The Bald Mountain Extension Company are getting everything in readiness to commence taking out pay about the 1st of January. The owners are all in splendid spirits over the outlook of their mine, and expect to get some big returns when they get fairly into the channel.

EXTENSION CO.—*Mountain Messenger*, Nov. 17: The Extension Company has not been taking out much pay gravel for the past two weeks. The lower part of the channel on the South Fork ground, which the Extension Company contracted to work, has been finished and abandoned. Since that time the company has been getting two thousand ft of new 11-inch air pipe in place; has put in about four thousand ft of heavy 6-inch water pipe to take up the water in the bottom of the tunnel, which water has long been a nuisance and the cause of much damage to the main tunnel; eleven hundred ft of tunnel has just been relaid with new steel rail, and considerable progress has been made on the turnout at the inner end of the main tunnel, near the bottom of the shaft last raised east of the deep channel. This work will be completed in about a week, when the work of taking out gravel will again be commenced, a breast having already been opened, which for ten days' work yielded nine ounces. As soon as the turnout is done, the work of raising an incline will be begun at the upper end of the turnout, to connect with the main tunnel already run some distance northeast from the shaft. This incline will be all in lava; will rise on a grade of one ft in four, and will be two hundred and forty ft long. The track will be double for something more than half its upper length, the lower part single track. It will be so arranged at first as to lower two loaded cars at once, the descent of the loaded ones drawing up the empty ones and the timbers, etc., used in the mine. The descent of the cars will be controlled by a compound jaw-break acting upon a four or six-ft break drum. A half-inch, flexible, steel wire rope will be used, winding from a wooden drum from two ft to thirty inches in diameter. This drum will be placed over the track at such a hight as to allow the cars to pass under it, thus avoiding the necessity for a double track at the top of the incline. Back of the drum will be a turnout of sufficient length to hold 12 or 15 cars. This work will not be completed for several months; in the meantime gravel will be taken out through the shaft. It will not be possible to work a very large force until these improvements have been completed. There is now enough water coming from the tunnel to wash all the gravel the company will be able to take out this winter. Should it be a very dry and cold winter, it may be found necessary to pump water from the shaft to furnish air. Contrary to the prediction of many, no difficulty has been experienced in getting a sufficient quantity of air through six thousand ft of eleven-inch pipe, to answer all the requirements of the works, and none is anticipated for a long time to come. It is expected, however, that a shaft will have to be raised, ultimately, at some point on the channel ahead, both for ventilation and as a means of egress from the mine, and perhaps as a means of conveying water as a source of power, should the company decide to prospect the deep channel just crossed by its main tunnel.

Siskiyou.

PICK AND PAN.—Yreka *Union*, Nov. 13: The Last Chance mine at Callahan, we learn by private letter from that place, has prospected very rich, and will no doubt be extensively operated next season. The paying channel runs north and south, consequently the crosscut made this season for prospecting was unprofitable, otherwise the claim would have paid a dividend. It can now be said that the claim has been thoroughly prospected, and next year the owners will know how to work it to the best advantage. The McConnell claim on Klamath river has yielded the largest of any in the county this season. The Fort Jones Company on the Klamath have pulled up their wheels and suspended work for the winter, after a highly satisfactory season's run. This is the first mine to close on the river, but others will closely follow. Mr. Charles Parrot, the superintendent, says the mine has yielded richly this season, but he expects better of it next. The Empire Bar Co., on Klamath river, pulled out last Saturday. We were unable to learn how the mine paid this season. Forty men are at work on the new ditch which is to convey water from the south fork of Salmon river to the Summerville hydraulic mine, a distance of four miles and a half. This mine paid handsomely last year, and would have yielded considerably more had not the water failed so soon. When the new ditch is completed, an abundance of water can be had.

Trinity.

AN IMPORTANT PURCHASE.—Trinity *Journal*, Nov. 15: A representative of San Francisco capitalists has recently spent several days in the East Fork quartz mining district, in this county, and was so well pleased with his examination of the developments of that section that the result has been the purchase of the properties owned by Holsinger & Co. While the deeds have been drawn with nominal consideration, it is understood that the actual price paid runs well into the thousands. We confidently look for a big boom in quartz in that district before many months.

RICH ROCK.—We this week pulverized and "horned" less than half a pound of quartz from the Brown Bear mine on Deadwood, and sold the dust for $1.50. The rock was also rich in sulphurets and barely showed gold when examined with a glass. If the owners have much of this kind of rock, the road to fortune is a short and sure one for them.

NEVADA.

Washoe District.

OPHIR.—Virginia *Enterprise*, Nov. 15: The west drift on the 500 level has not yet tapped the openings in the old workings. A good deal of water is flowing from the drift, but it is from openings in the ground in front of the vein. It will, however, now be but a short time before the drift will cut into the old workings. To guard againt any sudden rush of water the drill is kept well ahead. On the 1500 level some crosscutting has been done from the south drift but thus far no ore that will pay for working has been encountered. The portion of the old workings reached by the crosscut seems to have been pretty closely worked some years ago.

SIERRA NEVADA.—The north drift on the 3000 level is cutting streaks of quartz that assay from $2.50 to $5 per ton. At the 3300 station of the joint Ophir, Mexican and Union Con. winze the diamond drill has been run to all the cardinal points of the compass, and is now being pushed to the northwest. Thus far it shows but a slight flow of water, very little more than was found in the hole to the west.

UNION CON.—In what direction the first drift will be run from the 3300 level, has not yet been decided but it will probably be to the west.

HALE AND NORCROSS.—Good headway is being made in the work of sinking the main inclined winze below the 2900 level. How soon crosscutting will be commenced on the 2800 and 2900 levels depends upon the "powers that be" down at the Bay. From the 200 level the usual quality of ore is being extracted and shipped to the mills.

EXCHEQUER.—The winze connecting the 600 and 900 levels having been cleaned out and put in good order, there is now a fine circulation of air, and prospecting has been commenced in earnest on both levels. There is exposed on both levels an immense body of metal-bearing quartz.

CROWN POINT AND BELCHER.—These mines have been shut down for a few days past, in order to make necessary repairs to the machinery, but will shortly resume operations. Meantime, repairs have also been making in the mills on the river.

ANDES.—A good deal of repair work has been done during the past few days, though work has also been done in both the north and west drifts. The north drift is cutting quartz of a fine appearance.

ALTA AND BENTON.—The pumps are kept steadily running at about 6½ strokes per minute. A new drift has been started to the northward, but it seems likely to prove about as wet as those started some weeks ago.

SAVAGE.—Good progress is making in the E-street tunnel, and it will soon reach a point where it should find the streak of ore now being worked to the southward in the Hale and Norcross.

YELLOW JACKET.—About the usual quantity and and quality of ore is being extracted and sent to the mills. Meantime, a considerable amount of prospecting is being done.

UTAH.—Work has been resumed in the south drift on the 1950 level. The ground is porphyry

with seams of clay and occasional stringers of quartz.

BEST AND BELCHER.—The west crosscut on the 825 level at the north line of the Gould and Curry is still in porphyry, and has yet some distance to go to reach the vein.

GOULD AND CURRY.—The west crosscut on the 825 level at the north line of the Savage is cutting quartz that is metal-bearing, yielding assays of about $5 a ton.

COMBINATION SHAFT.—Rapid progress is making in the excavation of the station at the 3000 level, in which is to be placed the new hydraulic pump.

CALIFORNIA AND CON. VIRGINIA.—The usual progress is making in the northwest drift on the 1750 level. As yet no crossents have been run from this drift.

SCORPION.—The north drift on the 500 level is progressing about as usual, with no change of formation worthy of note.

OVERMAN.—Are extracting about the usual amount of ore from the old upper levels.

Bernice District.

GOLDEN CROWN.—Cor. Reno *Gazette*, Nov. 17: The Golden Crown Mining Company shipped six large bars of bullion this morning, of the value of $6,817, consigned to Livingstone & Co., San Francisco. The mine looks better as depth is obtained. The upper tunnel is in 480 and the lower tunnel 300 ft. At a depth of 360 ft. the ledge becomes solid. The ledge in the lower tunnel, which averages 18 inches in thickness, mills $100 per ton. The mill is kept running steadily, and with good results, the ore being free milling in character, and is worked up to from 87 to 91 per cent of its assay value. The Wild Goose Mining Company is working a force of ten men, taking out ore, and their ledge is showing finely. They recently made a strike of ore which assays as high as $2,000 per ton. This is the most prosperous mining camp in this part of the State.

Columbus District.

MOUNT DIABLO.—Candelaria *True Fissure*, Nov. 15: The incline is now 400 ft below the third level and a station is being cut out for the sixth level. This level will be 300 ft vertically below the third level. The west drift on the fifth level has been extended 11 ft and has shown small spots of ore during the week, and the face shows favorable ground for ore. The east drift, from the north crosscut on the fifth level, is in 17 ft, and shows nothing of value. A raise has been started from this north crosscut to connect with the lower winze No. 2, and there is a small streak of $80 ore showing in the face. The workings on the fourth level show no change. In the east intermediate, between the second and third levels, there is some $40 ore that looks promising.

Cottonwood District.

NICKEL.—*Silver State*, Nov. 16: George Lovelock shipped ten tons of nickel ore to San Francisco from his mines in Cottonwood a few days ago. The ore is valued at $240 per ton. Mr. Lovelock says the ore contains a higher percentage of metal at the greatest depth attained than nearer the surface. A New York company is making arrangements to erect furnaces on the Bell-Curtis nickel mine, which is situated near the Lovelock mine.

Esmeralda District.

AURORA.—Bodie *Free Press*, Nov. 14: For the past six months speculation has been rife as to what will be done with the mines of Aurora. It is the general impression that the properties operated by ex-Governor Blasdel during the past summer paid expenses at least, if they did not do better. It is also thought that when the mines were closed down, prospects were better than ever. Consequently the cessation of work at that time appeared unaccountable. Recently it was reported that the Governor had disposed of the controlling interest in the mines to Bodie parties. Why he should thus lose control of a paying property tended to increase public curiosity. It now transpires that the reported sale was not accomplished, and matters are as much in the dark as ever. There are many old-timers in this region who firmly believe that Aurora is destined in the near future to have a boom second only to that of the sixties.

Highland District.

MENDHA MINE.—Pioche *Record*, Nov. 15: While at Highland, last Sunday, we accepted an invitation from Foreman Trowbridge of taking a look in the mine. The horse that run across the ledge had but recently been cut through, and on the west side the ore was found as strong and plentiful as where it had been cut off, with an improvement in the quality of the ore. On the 115 level the men had just broke through the horse and got into ore. At this point the ore was but two feet in width. On the level below the men had entered the ore some distance, and at this place the ore breasts was several feet in width. There is much trouble and delay experienced at this mine owing to inadequate hoisting facilities. Most of the waste is wheeled in barrows and dumped into old drifts in other parts of the mine. The ore breasts in the mine look healthy, and may they continue in such condition.

Osceola District.

STRIKE.—White Pine *Reflex*, Nov. 15: A big strike in the gold quartz line, we learn from Geo. A. Richardson, who was in town yesterday, was made by Capt. Akey in Osceola a few weeks ago on the Cumberland ground. The specimens shown us show up well in free gold. If there is much of the same sort, a man with a mortar could easily hammer out $25 a day.

Santa Fe District.

PROMISING REPORTS.—*True Fissure*, Nov. 17: Promising reports continue to come from the mining camps of Garfield and Santa Fe, situated north and south of Luning. There are about 30 men in different places in the last-named locality, and some very rich developments are being made. Frequent shipments of ore leave Luning, some of them being copper of a very high grade. If the anticipations of some of the owners of copper claims are one-half realized, Esmeralda will be the best copper-producing county in the State.

THE NEW SMELTER.—*Inter-Mountain*, June 15: Prof. Hesse, late in charge of the reduction works at Gregory, has arrived to take charge of the new concentrator recently erected, and the smelter in process of erection, at Clark's, Colusa. The smelter, which will be ready for operation in about a month, will embrace many features new to the camp in the processes of reduction, it being the intention to institute experiments for the ascertainment of the methods by which the best results may be obtained before setting upon any really definite plan of action. Prof. Hesse comes to his new field of labor with that best of all recommendation—practical experience—to back up his claims as a successful manipulator of ores, and interesting developments may be looked for in the near future.

THE NEW COPPER CAMP.—*Tombstone Epitaph*, June 17: Quitaca the new copper camp in the Cannaneas, bids fair ere long to rival, if not surpass Bisbee in the production of copper ore. Already one 60-ton Water Jacket smelter is running to its full capacity, and others are in course of construction. Water and wood are abundant, the latter being secured for 80 cents a cord, delivered. The ore is remarkably free smelting, a large amount of flux purchased not having yet been touched. The bullion contains, in addition to copper, quite a large percentage of silver and gold, the bricks when struck ringing like a bell. The camp at present contains about 300 persons, and the usual quota of saloons, restaurants, lodging houses, etc.

Spring City District.

LIVE YANKEE MINE.—*Silver State*, Nov. 17: Nick Frayer, one of the principal owners of the Live Yankee mine at Spring City mine, was in town yesterday on his way to San Francisco to purchase two concentrators for the new mill. He says they have two feet of ore at a depth of 180 ft in the mine that will work $200 per ton. He expects to start up the mill about the 28th instant.

Tuscarora District.

BELLE ISLE.—*Times-Review*, Nov. 15: Good progress has been made in all the workings, and no material changes to note.

INDEPENDENCE.—No material change to report at any point. Drift west, on the 400-ft level, has been extended a total distance of 302 ft. Progress, the past week, 20 ft.

NORTH BELLE ISLE.—North drift, on east vein, from No. 2 crosscut, has been extended 6 ft; total length, 59 ft. The usual grade of ore has been extracted, and the indications are favorable for still better developments.

GRAND PRIZE.—East crosscut on the 400-ft level is in 68 ft; progress for the week, 13 ft. The stopes are producing the usual amount of ore, and show some improvement going north. The mill is running steadily and doing good work.

NAVAJO.—No. 2 upraise south of No. 3 crosscut, 150-ft level, has been carried up 9 ft; total, 18 ft. The ledge shows a good width of ore. All other workings on this level are looking well, and the usual quantity and grade of ore is being extracted. Drift south, on the 250-ft level, continues in ore; total length, 384 ft. Stopes on this level are without material changes. Everything is running smoothly at the mine and mill.

White Pine District.

HAMILTON.—Eureka *Sentinel*, Nov. 17: Col. Joe Grandelmeyer, who is in from our neighboring camp, says that things are quiet in Hamilton, and that coming into Eureka is like entering a bustling city. Still, over there mining is substantial and the prospects very encouraging. The Stafford is not just now "in bonanza," but gives as good a promise of big things as ever before. The mine is being worked economically and systematically by Manager Robinson. Col. Grandelmeyer is shipping five tons a week of high grade base ore to the Eureka furnaces from the C. O. D., Fay and Imperial mines, which he has charge of and is letting out to tributers. The expense of this is very heavy, but the ore pays enough to stand it. There are no facilities for reducing the base ores in Hamilton. The Colonel tells us that Supt. J. R. Kendall is working the Jennie A and his other mines, and reducing tailings, from which two sources he has for several months been getting out $3,000 per month in bullion. Manager Robinson has shipped from the mine, since the new find was struck, 73 bars of bullion, averaging $1,400 to the bar—altogether $102,200. A good deal of work is being done in the Hamilton mines on contract.

ARIZONA.

THE LAWRENCE.—*Miner*, Nov. 14: Mike Hickey and Mike Lawler left this morning for the above-named mine in the Agua Fria district, intending to be absent a couple of months, during which time they will sink an additional hundred ft on the property and run 50-ft north and south drifts. This property is one of the most promising silver mines in the county, and less than two months ago an offer of $16,000 was made and refused for it.

IN THE BRADSHAW RANGE.—Prescott *Courier*, Nov. 14: Although mine owners of Bradshaw district are not just now making a great stir in the mining world, they have high hopes for success in the future. The district is about 50 miles south of Prescott, in one of the largest mountain ranges in Arizona. Wood and water are abundant and the climate is excellent. The Tiger, the Gray Eagle, Cougar, Bond & Hayden's mine and the California, are well-known ledges. Sheriff Henkle owns a mine which is said to be rich in silver. It is not long since the Bond & Hayden worked $10,000 out of their rock. Riggs and other miners recently took out ore, which, when worked by the Tuscumbia mill, yielded handsomely. A wagon road from Alexandria to the Bradshaws is badly needed by the miners, who are now compelled to have supplies of all kinds packed in. Orcs, too, have to be sent out on the backs of animals, so that mining there is attended with expense which in other countries would be almost nothing.

COPPER BELT MINES.—Prescott *Courier*, Nov. 14: Messrs. John Kinlock and Lyman J. Baskin, having recently returned from New York, were in Prescott yesterday. They had been making an examination of the Copper Belt mines, of which Mr. Kinlock is the general manager, and Mr. Baskin, secretary. These mines are situated about 17 miles east of Prescott, in the foothills of the Black Hills range and about eight or ten miles south of the United Verde. They have been pronounced by those who have seen them, some of Northern Arizona's best. Mr. Kinlock is regarded as an excellent judge of mines and especially in the Black Hills district with which he is very familiar, having pronounced the Wade Hampton, of the United Verde, a very valuable property before much attention was given it by mining men. The Copper Belt M. Co., which has purchased the Copper Belt mines, was organized last May in New York on $300,000. The officers of the company are Jas. W. Smith, president; Lyman J. Baskin, secretary; Wm. Montgomery, Jr., treasurer; John Kinlock, general manager. It is generally known that officers and stockholders are gentlemen of easy circumstances and that they have great confidence in their purchase. The general manager has not decided when he will begin active operations, but it will be very shortly. From what we can learn, the management will proceed continuously and the greatest economy will be practiced in every department. The ores are usually high grade in copper and rich in silver, simply treated and the mines are as acceptable as any we know.

A NEW FIND.—Arizona *Citizen*, Nov. 18: As an example of the imperfect manner in which the mineral belts of Arizona are prospected, it is stated that a couple of miners took a little prospecting stroll a few miles from this city two weeks ago, and succeeded in finding several good, strong ledges of silver ore that gave assays running from $60 to $200 per ton, and some picked specimens will give over $500. These ledges have been walked over hundreds of times by prospectors and still remain undiscovered until chance led these men to the spot. They are now organizing for working the properties with a view to shipping the ore. As the new discovery is only 6 miles from the court-house, their good fortune will probably prove a big fortune, and one that will benefit the city to a considerable degree. So soon as the work of development is well under way and several adjacent claims secured, the whole matter will be given publicity.

COLORADO.

NOTES.—Georgetown *Courier*, Nov. 15: A mill-run from the Gen. Logan lode in Spring gulch had a few days ago, returned $600 per ton in gold, silver and copper. At a depth of a few feet on the Newport, a new discovery on Red Elephant, the owners have opened up a small vein of galena and decomposed ore which yields 266 ounces silver per ton. During the month of October there were 53 cars of ore shipped from the Georgetown depot, 19 of which went to Denver, 6 to Golden, and 28 to Argo. The whole aggregated 695 tons, valued at about $90,000. Work has been resumed on the Annie D. lode, on Mill creek. The shaft is to be sunk 300 ft, and drifts will be run from the bottom 100 ft east and west. A good quantity of ore is shown in the shaft, which assays, 400 ounces in silver. The Astor mine, on Democrat mountain, owned by an English capitalist, will soon be started up with a force of 100 men. This mine has lain idle for two years, pending sale. Large bodies of ore are opened up in all its workings. When this mine is in good working order, it will add largely to the output of the county. Quite a large mining sale occurred this week. E. L. Dunbar, of Bay City, Michigan, disposed of a half interest in the Humboldt mine and a three-fourth interest in the Chicago lode, both in Cascade district, to Michigan and Colorado parties. The consideration was $17,662. In the purchase of the West Roe lode, Mr. H. M. Griffin now owns probably as good a mining property as there is in this section. In addition to the Seven-Thirty mine he owns 20 adjoining patented claims. These control the Seven-Thirty vein for over a mile and embraces 70 acres of surface ground, nearly half of which is well timbered. A large body of solid ore has been exposed in the bottom of the 300-ft shaft of the Queen mine, in Horseshoe gulch. It measures 12 inches in width and carries galena and gray copper and small quantities of silver glance and ruby silver ore. The ore mills 1380 ounces silver per ton. This is probably the best strike made in that section for quite a while. The Mendota output for October, outside of 40 tons yet unmilled, is as follows: Silver, $3,628.67. Lead, $2,518.53. Total, $6,147.20. This is only about three-fifths of our ore mined, and the whole production for the month will probably aggregate over $11,000. The total product of the mine from June 1 to October 31, 1884, is about $63,000.

IDAHO.

AN IMPORTANT ENTERPRISE.—Wood River *Times*, Nov. 14: Colonel Wall has just made a very important change in the development work on the property of the Wood River Gold and Silver Mining Company, at Bullion. Heretofore the work has been from the surface down. This was undoubtedly the proper way to work as long as there was any doubt of the continuity of the mine in depth. But, now that the vein is proved to be a true one, it is the part of wisdom for mine-owners to avail themselves of all the natural advantages which the location of their properties afford, and to drive tunnels when possible, instead of sinking shafts, inclines or winzes. These were probably the considerations that actuated Colonel Wall when he determined to drive a deep tunnel to tap the ledge in the Bullion mine. This tunnel has been commenced during the past day or two and will be completed by next spring. It will tap the ledge at a depth of over 700 ft, confirm the confidence already felt in the permanency of our mines, and greatly reduce the cost of extracting ore and opening up the property.

THE BUZZO COMPANY.—Supt. Buzzo, of the Buzzo Silver Mining Company, reports his new concentrator working well. It has a daily capacity of 30 tons, and has already produced one car-load of concentrates that sold for $2,229. The claims of the Buzzo Co. comprise some 150 acres on Warm Springs creek, and yielded some $12,000 the past summer, paying a small profit over expenses. Now that the new concentrator is running, this yield will be greatly increased. The works will be kept going all winter, and about 20 men will be employed.

THE SULTAN MINE.—Idaho *Keystone*, Nov. 10: This promising piece of mining ground is situated on Boulder creek, about 18 miles from Ketchum. It is owned by Ole Rorem and Frank Weaver. Rorem purchased it in August last, and afterward sold a one-third interest to Weaver, at which time there was no developments of consequence upon it. They soon after commenced work, and found three different veins within the boundaries of the location. They are well defined, and about 100 ft apart. They have been working four men, and have made several shipments of ore. The ore is high-grade galena and carbonates, and appears to be abundant. The last shipment netted $180 per ton. On Sunday last the workmen made a strike in a new cut on one of the veins exposing about two feet of solid ore similar to that brought to the sampling works. They will have eight men at work through the winter, and by spring-time the Sultan, if it continues to improve in the same ratio it has of late, will be one of the best producers in that district. The Boulder prospects are paying from the grass-roots, and there are a number of ledges in the vicinity of the Sultan as promising as it is, and which will undoubtedly make paying mines. Old Atlanta, one of the richest little districts in Idaho, is taking on a new lease of life. The new Monarch mill will be ready to commence crushing about the middle of December. The Tahoma mill is running regularly, and yielding well. Very rich strikes have lately been made in a number of the Blythorse mines. Commissioner Shoup has collected a good lot of rich ore from that district.

BONANZA AND CUSTER.—*Keystone*, Nov. 10: Mining news is scarce at present. The old reliable mines, such as the Custer and Montana, go steadily on producing ores, and much is being done in the way of development. The Wonder, owned by the Galatian Bros., has a vein 4½ ft wide of very rich ore. This fall they have been putting up buildings, burning coal and getting everything in readiness for an active winter's work. Joseph Galatian has charge of the mine. W. B. Galatian has gone East to spend the winter, but will return early in the spring. It is to be hoped by that time the property may have increased in richness to such an extent that it may indeed be a Wonder to him. J. G. Morrison has made the last clean-up for the season on the lower bar of his placer mine, and the yield was a very satisfactory one. He is now preparing to run a new tunnel on the Washington where some very rich specimens of ore have recently been found.

HOODOO.—Palouse *News*, Nov. 15: The Hoodoo mines are fast approaching a reality. Placer claims are being opened up every day and proving to be richer than was expected. New quartz ledges are being discovered every day, and some of the rock is so rich that gold can plainly be seen in it with the naked eye. There are at present about 200 men in the camp.

MONTANA.

THE ALICE PUMP.—*Inter-Mountain*, Nov. 15: The machinery for the mammoth new pump at the Alice is daily arriving, and workmen are busily engaged in putting the leviathan together. The masons have been at work for the past week on the foundation and in setting the anchors, and from present indications it is not likely that the steam will be let into the cylinders until some time in the latter part of January. The building covering the pump is completed and the danger of delays from inclement weather is thereby considerably lessened.

NEW MEXICO.

NOTES.—Silver City *Enterprise*, Nov. 15: P. J. Mitchell, one of the best known mining men in New Mexico, is in from Shakespeare, and reports his San Simon prospects, which he is at present engaged in developing, as looking well. Several very rich pockets of gold ore have been struck recently in the Pinos Altos district. One alone is said to have yielded its discoverer several thousand dollars. We are promised the data from this strike in a short time. George Goodwin and "Pap" Wyman have bonded a group of mines in the Cow Spring district, near the claims owned by Louis Timmer, George Dickerson and Mr. Boyd, to Wilson Bros. and John B. Sellers. The property has an immense vein of low-grade ore that if treated upon the ground would pay well. The Sumner group of mines, owned by James Mullen, "Pap" Wyman, E. H. Colson and George Goodwin are being worked by the latter gentlemen. This property excited some attention two years ago, until the ore vein pinched, and the owners abandoned the claims since which time no work has been done. J. T. Mitchell, superintendent of the Telegraph Company's property, departed for St. Paul on Saturday last. Notwithstanding the expense attached to shipping ore of that camp, Mr. Mitchell has made the property pay more than expenses for the past six months and has unwavering faith in the future of the property. Seven bars of bullion from the Mimbres Company's mill at Georgetown, passed through this city Tuesday, for New York. Each bar is worth about $1,300, making a total of $9,100. The mill is turning out bullion at the rate of from $40,000 to $50,000 per month, with prospect of pressing these figures. There will be another shipment of 7 or 8 bars additional tomorrow.

UTAH.

REVIEW.—Salt Lake *Tribune*, Nov. 15: The receipts of bullion and ore in this city for the week ending November 12th, inclusive, were $113,743.26 of bullion, and $12,800 ore; an aggregate of $126,543.26. For the week previous the receipts were $134,550.27 in bullion, and $21,810 in ore; total, $156,360.27. The receipts from the Horn Silver for the week ending Nov. 12th, inclusive, were 14 cars of bullion, $52,000, making the total output for the year to date, $2,239,000. Notice has been given of the payment in New York, Nov. 15th, of the regular quarterly dividend (No. 15) of 75 cents a share aggregating $300,000. Total dividend this year, $1,200,000. The shipments of the Ontario for the week ending Nov. 12th, inclusive, were 56 cars of bullion, $20,611.93, bringing the total shipments of the year to date, up to $1,447,474.07. Silver Reef yielded for the week 4 bars Christy silver, $5,800, and 2 bars Stormont silver, $2,750; a total of $8,550. The products of the Hanauer smelter for the week was 12 cars of bullion, $23,100. From Idaho there was received during the week 4 cars of Queen of the Hills ore, $1,950; and 3 cars of miscellaneous ores, $5,950; a total of $10,900. In digging ditch for pipes to convey water from Pine gulch to the Lead mine, a deposit of crystallized lead, (cerusite) ore, between porphyry and granite, was struck, about 500 ft from the head of the ditch, on which an adit has been driven in 40 ft, exposing, now, 7 ft thickness of ore, 12 lead and 50 silver. A wagon road is being made to it and shipments are to be made. Five locations have been made on it, covering its strike 2,200 ft, by the Lead Mine Co. and Treweek Bros. It is called the Keystone group.

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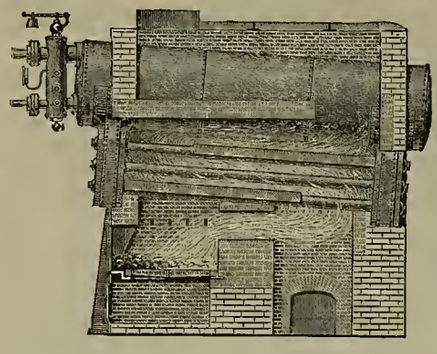
SAN FRANCISCO, Sept, 19, 1884.

Risdon Iron and Locomotive Works—Gentlemen: We have had one of your Heine Patent Safety Boilers in use for four months at our Borax Works, in Alameda. It does good work and gives perfect satisfaction. Yours truly,
(Signed) WM. T. COLEMAN & CO.

SAN FRANCISCO, Oct. 4, 1884.

Risdon Iron and Locomotive Works—Dear Sirs: I am using one of your Heine Patent Safety Boilers in my Candy Factory on Twenty-Third street, near Valencia. For economy of fuel, safety and efficiency I have never seen its equal. Very truly yours,
(Signed) W. S. TOWNSEND.



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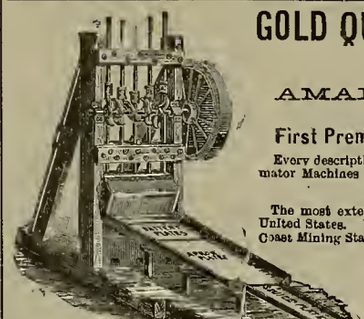

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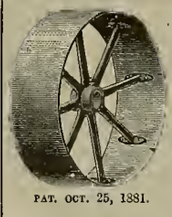

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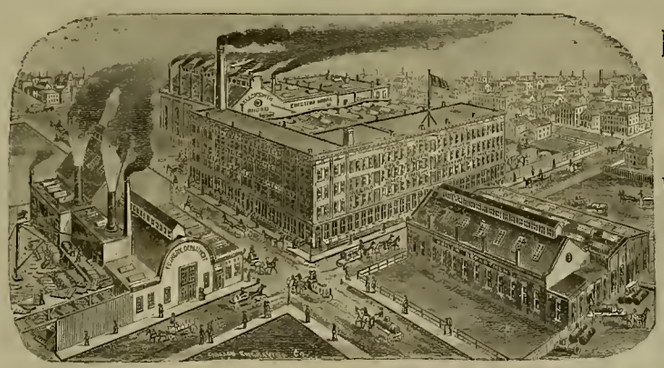

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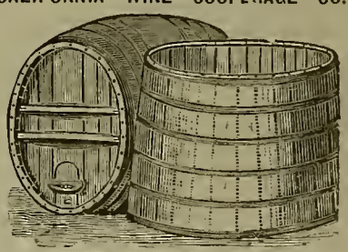

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Academy of Sciences.

At the regular monthly meeting of the Academy of Sciences on Monday evening, Dr. Harkness in the chair, George P. Reynolds and John Bermingham were elected members. Among the donations to the museum was a specimen of alcynoid polyp, from John C. Staples. The specimen was found in the Behring sea, and is thought by the curator of the museum to be a new species. Only three specimens of this group have been found on this coast, and this one is different from those in the Academy's collection. Mr. Elihu Morris sent a fossil egg found in Sioux county, Nev. The same gentleman sent specimens of Indian beads; bark, leaves and wood of the California cork oak, from Visalia. From Thomas L. Perry, lighthouse keeper at Point Conception, Cal., a pseudo-squilla. From Mrs. Tenney, of Portland, Me., specimen of the Eastern lobster from Casco bay, Me. From the Neptune Fishing Association, a fish known as the Ramora of Linnæus, but commonly called the pilot fish, although it is not the true pilot fish. This was taken, attached by its sucker to a shark, which was caught outside the heads.

Dr. H. Herman Behr spoke of the peculiar physical characteristics of the Oregon cedar, a large forest tree growing along the northern border of California and Southern Oregon. Strong volatile elementary oils, as well as resins, are found among its constituents. It is largely used for lumber, and laborers inhaling dust from the mills often experience long periods of prostration, and are forced to stop work. Dr. Behr read an extract from an essay by Wm. H. Dick, of the Pharmaceutical Society, on the medicinal effects of the volatile oils of this tree.

It seems that the effects of inhaling the volatile oils are felt in the urinary organs by those who work this wood in the saw-mills. Mr. Dick experimented with the oil, to test its effects when taken internally. He said, however, that hereafter be should select a dumb animal to try its effects on, rather than upon himself. The first day he took two drops ou sugar, and no effects were felt. In six days he increased the dose to twenty drops, when he was doubled up with fearful griping pains, and watery discharges began, and confined him to his room for five days. It works in an entirely different manner when inhaled from when taken into the stomach, showing that it is not well to place reliance on mere hearsay in such matters. He said we are here surrounded by a local vegetation of whose medical properties we know hut little, and he earnestly desired to direct the subject to the careful attention and consideration of the medical and pharmaceutical profession.

Mr. Harford announced the death of the Academy's ex-President, Dr. Henry Gibbons, Sr., who was one of the original seven members who first met to form this Academy of Sciences. Dr. Albert Kellogg and Dr. Harkness were appointed a committee to frame and offer suitable resolutions at the next meeting.

Mining Share Market.

There is little new to report concerning the mining share market. The expected activity after the election excitement was over has not been so marked as was hoped. At the north end of the Comstock, work is steadily progressing at all points. At the 3300 station of the joint Ophir, Mexican, Sierra Nevada and Union Con. winze, the Diamond drill is being used in the examination of the ground in all directions in order to ascertain the quantity of water liable to be encountered in drifting. The ground in all directions appears to be the same mixture of quartz and porphyry that is found at the station and in the bottom of the winze. Good prospects are being found in the west cross-cut on the 825 level of the Gould and Curry near the Savage line. At this point there is a large area of wholly unexplored ground. At the Hale and Norcross they are pushing the main winze down toward the 3000 level as rapidly as possible. A good deal of activity is at present being displayed in the Alpha and Exchequer mines, where they have an immense body of metal-bearing quartz. Explorations are being pushed on both the 600 and 900 levels. At Gold Hill, the Yellow Jacket is running right along as usual, but the Belcher and Crown Point works have shut down for a few days for the purpose of making needed repairs to the boilers and machinery. Meantime repairs are also being made at the mills on the river, where the ore from these mines is worked.

Bullion Shipments.

King, 16, $3,861; Bismark, 16, $5,768; Queen of the Hills, 12, $2,300; Horn Silver, 12, $12,000; Ontario, 12, $13,756; Christy, 12, $1,600; Horn Silver, 13, $9,000; Stormont, 13, $2,750; Queen of the Hills, 13, $1,350; Hanauer, 13, $4,600; Idaho ores, 14, $1,400; Hanauer, 14, $4,500; Horn Silver, 14, $9,000; Ontario, 14, $15,554; Vienna, 14, $3,014; Christy, 14, $1,600; Horn Silver, 15, $6,000; Vienna, 15, $1,506; Hanauer, 15, $2,500; Crescent, 15, $2,600; Nevada ore, 15, $1,950; Queen of the Hills, 15, $3,000; Paradise Valley, 16, $7,794; Hanauer, 16, $4,200; Horn Silver, 16, $6,000; Golden Crown, 16, $6,817; Bonanza King, 8, $7,595; Bodie, 17, $21,807; Navajo, 17, $14,000; Christy, 19, $3,311. During the week ending, Nov. 15th, the following shipments of bullion, ore and lead were made out of Utah Territory: Thirty-seven cars of bullion, 935,267 pounds; seven cars of ore, 210,940 pounds, and four cars of lead, 102,203 pounds.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AMT. LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M & M Co	Alaska	8	70	Oct 14	Nov 15	Dec 5	E F Stone	306 Pine st
Butte Creek Hyd M Co	California	10	10	Sept 18	Nov 6	Nov 29	R L Taylor	220 Montgomery st
Caborca M Co	Mexico	9	03	July 18	Nov 1	Dec 1	C Bone	328 Montgomery st
Chollar M Co	Nevada	15	50	Oct 29	Dec 2	Dec 23	G L McCoy	309 Montgomery st
Con Va & California M Co	Nevada	1		Nov 5	Dec 13	Jan 3	A W Havens	309 Montgomery st
Crocker M Co	Arizona	1		Oct 31	Dec 2	Dec 23	A Waterman	309 Montgomery st
Daisy Cement M Co	California	2	02	Sept 26	Nov 8	Nov 29	C J Collins	512 Montgomery st
Day S M Co	Nevada	15	75	Sept 26	Nov 3	Dec 2	E M Hall	327 Pine st
Gould & Curry S M Co	Nevada	49	50	Oct 25	Nov 29	Dec 22	A K Durbrow	309 Montgomery st
Golden Fleece G M Co	California	34	40	Oct 13	Nov 18	Dec 8	F Schirmeier	412 Sixth st
Lamphire G M & M Co	California	1	10	Oct 3	Nov 17	Dec 8	A Martin	526 Montgomery st
Lewis Con M Co	Arizona	5	03	Nov 14	Dec 22	Jan 19	J W Few	310 Pine st
Marshall M Co	California	2	10	Nov 6	Dec 15	Jan 5	A L Perkins	310 Pine st
Mexican G M Co	Nevada	23	50	Nov 11	Dec 17	Jan 8	C E Elliott	309 Montgomery st
Ophir M Co	Nevada	48	50	Nov 12	Dec 17	Jan 6	E B Holmes	309 Montgomery st
Peerless M Co	Arizona	2	25	Sept 25	Nov 3	Nov 29	A Waterman	309 Montgomery st
Rainbow M Co	California	12	15	Oct 24	Dec 1	Dec 29	F Marhardt	311 Montgomery st
Standard M Co	California	1	25	Oct 17	Dec 1	Jan 5	W Willis	309 Montgomery st
Sierra Nevada S M Co	Nevada	80	50	Oct 22	Nov 26	Dec 25	E L Parker	309 Montgomery st
Savage M Co	Nevada	61	50	Nov 11	Dec 15	Jan 5	E B Holmes	309 Montgomery st
Utah S M Co	Nevada	51	50	Oct 23	Nov 28	Dec 16	G C Pratt	309 Montgomery st
Union Con M Co	Nevada	28	50	Nov 5	Dec 9	Dec 30	J M Buttington	309 California st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Butte Creek Hyd M Co	California	R L Taylor	230 Montgomery st	Annual	Dec 1
Chicago Con M Co	Nevada	John Nuttall	608 Montgomery st	Annual	Nov 24
Cuevas Santa M Co	Mexico	W Letts Oliver	328 Montgomery st	Annual	Nov 25
Eintracht Gravel M Co	California	H Kruz	209 Sansome st	Annual	Dec 2
Kentuck M Co	Nevada	J W Pew	310 Pine st	Annual	Nov 26
Mexican M Co	Nevada	C E Elliott	309 Montgomery st	Annual	Dec 2

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Oct 8
Navajo M Co	Nevada	J W Few	310 Pine st	25	Nov 13
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Oct 29
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Nov 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Nov 6

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication in this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.]

DATE. Nov. 13-19	Portland. Rain.	Temp.	Wind.	Weather.	Red Bluff. Rain.	Temp.	Wind.	Weather.	Sacramento. Rain.	Temp.	Wind.	Weather.	S. Francisco. Rain.	Temp.	Wind.	Weather.	Los Angeles. Rain.	Temp.	Wind.	Weather.	San Diego. Rain.	Temp.	Wind.	Weather.
Thursday	.00	54	SW	Fr.	.04	56	N	Cy.	.00	66	SE	Fr.	.03	62	SE	Cy.	1.01	66	SW	Fr.	.01	68	W	Fr.
Friday	.00	53	S	Cy.	.00	62	S	Cy.	.00	65	S	Cy.	.00	62	SE	Cy	.00	67	SE	Cl.	.00	66	W	Fr.
Saturday	.18	49	N	Cy.	.00	62	E	Cl.	.00	65	S	Cy.	.00	58	SW	Fr.	.00	67	SW	Cl.	.00	64	W	Cl.
Sunday	.55	49	SW	rain	.00	62	N	Cl.	.00	58	NW	Cl.	.00	57	NW	Cl.	.00	65	S	Cl.	.00	64	W	Cl.
Monday	.01	49	NW	Cl.	.00	62	N	Cl.	.00	58	N	Fr.	.00	55	E	Fr.	.00	64	SW	Cl	.00	65		Cl.
Tuesday	.01	47	NW	Cl.	.00	62	N	Fr.	.00	58	S	Cl.	.00	61	NE	Fr.	.00	72	NW	Cl	.00	66		Cl
Wednesday	.00	44	S	Cy.	.00	60	N	Fr	.00	57	N	Cy.	.00	59	NE	Cy	.00	75	E	Fr.	.00	70		Cl.
Totals	.74				.01				.00				.03				1.01				.01			

EXPLANATION.—Cl. for clear; Cy., cloudy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature wind and weather at 11:58 A. M. (San Francisco mean time), with amount of rainfall in the preceding 24 hours

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 30.		WEEK ENDING Nov. 6.		WEEK ENDING Nov. 13.		WEEK ENDING Nov. 20.	
Alpha	1.15	1.45	.90	1.10	.95	1.00	.65	.90
Alta	1.60	1.75	.85	1.35	.75	1 20	.55	.75
Andes	.05	.35	....	.30	....	.30	....	.25
Argenta	....	....	....	.05	....	....	....	....
Belcher	.75	.80	.70	.70	1.45	.45	.65	....
Belding	....	....	....	....	....	....	....	....
Best & Belcher	1.70	1.90	1.50	1.70	1.30	1.70	1.00	1.30
Bullion	....	.27	....	.20	....	.25	.15	.75
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	.45	.50	....	.50	....	.25	.25	.30
Bodie Con	2.70	2.80	2.05	2.75	2.45	3.00	2.80	3.20
Benton	....	.45	.25	.35	.20	.30	.15	.20
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	.65	.75	.35	.55	.55	.60	.40	.50
California	....	.45	.25	.40	.15	.30	....	....
Challenge	....	....	....	.15	....	....	....	....
Champion	.30	.40	....	.30	....	....	....	....
Chollar	2.30	2.50	1.95	2.25	2.10	2.35	1.35	1.75
Confidence	....	....	....	.80	....	.70	.50	.65
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	....	.45	.25	.40	.15	.30	.10	.15
Con. Pacific	.85	.90	....	.90	....	.95	.90	.95
Crown Point	....	1.40	.90	1.25	1.00	1.05	.55	.80
Day	....	....	....	....	....	.75	....	.75
Eureka Con	....	3.80	....	2.95	....	3.00	....	....
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	....	.25	.05	.20	....	.15	.20	1.00
Grand Prize	....	.15	.15	.20	.10	.15	....	....
Gould & Curry	1.10	1.30	.95	1.10	.90	1.00	.55	.75
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	3.10	3.20	3.10	3.25	2.85	4.00	2.25	2.85
Holmes	....	....	3.40	3.50	....	....	3.50	3.75
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	....	....	....	.15	....	.15	....	.10
Martin White	.10	.45	....	.40	....	....	....	....
Mono	1.60	1.70	1.10	1.55	1.30	1.55	1.30	1.50
Mexican	1.00	1.15	.90	1.00	.65	1.00	.55	.70
Mt. Diablo	....	3.00	3.50	3.80	3.50	3.75	....	3.50
Northern Belle	....	....	....	....	....	....	....	....
Navajo	3.80	3.90	3.75	3.80	3.75	3.95	3.00	3.55
North Belle Isle	....	.45	.50	....	.45	....	....	.40
Occidental	1.45	1.50	....	....	1.25	1.50	1.00	1.15
Ophir	.80	.80	.75	1.00	.80	.85	.50	.60
Overman	.15	.20	.15	.20	....	....	....	.10
Potosi	1.20	1.30	1.00	1.15	.90	1.15	.65	.95
Pinal Con	....	....	....	....	....	....	....	....
Savage	1.35	1.40	1.25	1.35	.95	1.45	.65	.90
Seg. Belcher	....	....	....	....	....	....	....	.50
Sierra Nevada	.95	1.10	.80	1.00	.80	1.00	.45	.65
Silver Hill	....	.05	....	....	....	....	....	....
Silver King	....	4.15	....	4.05	....	1.13	4.75	5.00
Scorpion	.14	.15	....	.15	....	.45	....	.10
Syndicate	....	.55	.50	.55	.45	.55	....	.45
Toga	....	....	....	....	....	....	....	....
Union Con	.80	.90	.75	.90	.55	.90	.45	.65
Utah	.60	.80	.55	.60	.45	.55	.30	.40
Yellow Jacket	1.80	1.85	1.60	1.80	1.50	1.75	.90	1.50

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Nov. 20.

150	Alta		55c
200	Bodie		3.15
200	B. & Belcher		1.10
200	Benton Con		15c
100	Bulwer		40c
50	Con. Pacific		95c
250	Chollar		1.85
100	Crown Point		75c
120	Day		75c
100	Exchequer		15c
350	Gould & Curry		55c
50	Grand Prize		10c
115	Hale & Norcross		2.60@2.65
100	Holmes		3.70
750	Justice		15c
470	Mexican		55c@60
100	Mono		1.35
130	Navajo		3.20
100	Ophir		55c
100	Ophir		55c
420	Potosi		85c
340	Sierra Nevada		50c@55c
300	Savage		80c
100	Union Con		55c
50	Yellow Jacket		1.20

AFTERNOON SESSION.

400	Alta		55c
20	Bodie Con		2.80
350	Bulwer		55c
150	Benton		30c
100	B. & Belcher		1.05@1.10
450	Con Va & Cal		30c
1340	Chollar		1.80@1.90
70	Crown Point		1.00@1.05
200	Gould & Curry		65@70c
1530	Hale & Norcross		2.50@2.65
400	Mexican		60c@65c
20	Mono		1.30
370	Navajo		3.75@3.85
745	N. Belle Is		45c
500	Ophir		55c
30	Occidental		1.85
250	Potosi		75@85c
50	Syndicate		55c
200	Scorpion		25c
550	Sierra Nevada		55c
600	Savage		75@80c
95	Union		50c
100	Yellow Jacket		1.15

San Francisco Metal Market.

[WHOLESALE.

THURSDAY, Nov. 20, 1884.

ANTIMONY—Per pound		@	—
Hallet's		13 @	—
Cookson's		14 @	—
BORAX—Refined		7½@	8
IRON—Glengarnock ton		25 00 @	—
Eglinton, ton		24 00 @	—
American Soft, ton		27 00 @	—
Oregon Pig, ton		— @	—
Clipper Gap, Nos. 1 to 4		30 00 @	32 50
Clay Lane White		22 00 @	—
Sheets, No. 1		26 00 @	—
Refined Bar		3 @	5½
Boiler, 1 to 4		5 00 @	5 50
Plate, 5 to 10		4½@	4¾
Nail Rod		7 @	—
Norway, according to thickness		6 @	7
STEEL—English, b.		15 @	25
Black Diamond, ordinary sizes		13 @	—
Drill		15 @	—
Machinery		12 @	14
COPPER—Ingot		14 @	15
Braziers' sizes		28 @	37
Fire boxsheets		28 @	—
Bolt		23 @	25
Bar		— @	—
Cement, 100 fine		12 @	—
Copper in New York, Nov. 19		12¾@	—
LEAD—Pig		3½@	4
Bar		5½@	—
Pipe		7 @	—
Sheet		8 @	—
Shot, discount 10% on 500 bags: Drop, ₱ bag		1 85 @	—
Buck, ₱ bag		2 05 @	—
Chilled, do		2 25 @	—
TINPLATE—Alucastle		5 25 @	6 00
Charcoal		5 25 @	6 75
Coke		5 25 @	6 50
Roofing		6 25 @	13 50
ZINC—German		9 @	10
Sheet, 7x3 ft, 7 to 10 lb, less the cask		9 @	10
QUICKSILVER—By the flask		30 00 @	—
Flasks, new		1 05 @	—
Flasks, old		85 @	—

Civil Engineer.

A Civil Engineer, thoroughly familiar with all Horticultural work and Wine-making, wants employment. Is competent to take entire charge of large estate or ranch, lay out new work, etc. Very best references. Say advertised in this paper and address P. L. H., 1506 Pacific Avenue, San Francisco.

ENGLISH authorities are breaking up the Salvation Army,

The Nahl Art Collection.

There are probably many people either resident in this city or who occasionally pay it a visit, that are not aware that we have in our midst one of the art treasures of the Old World, in the shape of a very complete, rare and undoubtedly genuine collection of the paintings of the Old Masters. These are the property of H. W. Arthur Nahl, an artist of this city, and are on exhibition every Saturday at the Old Merchants' Exchange building on Battery street, opposite the postoffice. They came into Mr. Nahl's possession about three years ago, having been bequeathed to him by his uncle, John Wilhelm Nahl, of Cassel, Germany, who died at the advanced age of 77 years, having spent the greater part of his life, fortune and great talents in increasing and caring for this collection, many of which had been the property of his remote ancestors. The Nahls have been a noted family of artists and sculptors as far back as their history has been traced, which is in the early part of the 17th century. The catalogue embraces 150 pictures, besides many other rare and curious historical relics. Of these paintings 78 are originals of the Old Masters, and the remainder are copies of other famous antique paintings or portraits, by noted modern artists, including different members of the Nahl family. Among the former we find, in wonderful preservation, the works of such famed ancients as the following: Raphael (1483–1520); Leonardo da Vinci (1452–1519); Titian (1477–1576); Remhrandt (1607–99); Ruhens (1577–1640); Correggio (1494–1534); Guido Reni (1575–1642), and others of almost equal fame. The gem of the collection is a painting hy Raphael, 46x60 inches, called the "Danse d'Amours led hy Cupid." It alone is valued at $100,000. Mr. Nahl was offered $25,000 in this city for a painting 41x35 inches, from the hrush of a Spanish artist called Spagnoletto (1588–1656), entitled "Dying Cato." It is a ghastly, hut masterly piece of work, and is one of the rarest in the collection. The offer was refused, as Mr. Nahl desires to have the collection kept intact. This collection was for a short time on exhihition at the rooms of the Art Association, on Pine street, and evoked the highest encomiums of the critics and the press. Mr. Nahl had it brought here from Europe at great expense, wishing it to he located in his adopted State. He expected to dispose of it here to some of our wealthy citizens or associations, as he does not consider himself justified in keeping such an expensive collectinn, while he is yet an artist following his profession for his livelihood. He has offered the collection, exclusive of family relics and portraits, for what is considered the very reasonable sum of $500,000. It is understood that one of our wealthy capitalists cnntemplates purchasing and presenting it to the Academy of Sciences of this city. In case the collection is not disposed of before spring, Mr. Nahl thinks he will ship it to Eugland, where it will readily hring that sum. It is impossible, in the limits of a brief newspaper notice, to more than allude to the beauties and attractions of this magnificent collection. Every admirer of rare and antique art in the State should certainly see this greatest artistic collection ever brought to this country, before it may be taken away.

Thanksgiving Proclamation.

The following Thanksgiving proclamation has been issued by Governor Stoneman:

STATE OF CALIFORNIA,
Executive Department.

In accordance with custom, and in conformity with the proclamation of the President of the United States, I hereby designate and set apart Thursday, the 27th day of November, A. D. 1884, as a day of thanksgiving and prayer throughout the State. In witness whereof, I have hereunto set my hand, and caused the great seal of the State to be affixed at the State Capitol, in the city of Sacramento, on this, the 17th day of November, A. D. 1884.

GEORGE STONEMAN,
Governor of the State of California.

Attest: Thomas L. Thompson,
Secretary of State.

USEFUL HOLIDAY PRESENTS FOR YOUNG AND OLD may be found at Muller's Optical Depot, 135 Montgomery St., near Bush, opposite the Occidental Hotel, San Francisco, as follows: Elegant Mercurial Barometers for Offices, Halls, Libraries, Hotels, Vessels, etc. Pocket Altitude Barometers for Mining Engineers. A full line of elegant Thermometers, Mining Compasses, Microscopes for Boys, from $1.00 to $10.00—something more costly and suitable for a Doctor's Office, both useful and ornamental. Opera, Field and Marine Glasses, Drawing Sets, Fine Gold Pehble Spectacles and Eye Glasses expressly made for the Holidays. Great pains taken in selecting Spectacles or Eye Glasses to be sent away for Christmas.

C. MULLER, Leading Optician, 135 Montgomery St., near Bush, opp. Occidental. x

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First street, a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below costs, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. References as to above can be had upon applying to this office.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & CO.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.]

FOR WEEK ENDING NOVEMBER 11, 1884.

307,831.—PISTON PACKING—Barendt & Carter, S. F.

307,929.—CAN HOLDER—J. W. Edwards, Seattle W. T.

307,942.—GRAVITY PLEASURE ROAD—Philip Hinkle, S. F.

307,856.—DIRT SCRAPER—H. O. Hooper, S. F.

307,949.—HARROW, ETC.—W. F. Hubbard, Walla Walla, W. T.

307,860.—DOUBLE HAMMER BELL—F. O. Landgrane, S. F.

307,861.—PNEUMATIC MINING TUBE—Leonard & Corcoran, S. F.

307,863.—DIGITORIUM—A. Lothhammer, Sact'o.

307,870.—CARTRIDGE IMPLEMENT—J. B. Richardson, Mountain View, Cal.

307,988.—DYNAMITE—J. H. Robertson, S. F.

307,989.—EXPLOSIVE COMPOUND—J. H. Robertson, S. F.

307,882.—OATMEAL MACHINE—A. Swingle, S. F.

307,893.—METALLIC LATH—J. W. Wissinger, S. F.

307,825.—BOTTLE STOPPER CLAMP—J. B. Wollard, S. F.

11,648.—TRADE MARK—Sam'l Elmore, Astoria, Or.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Ageney, the following are worthy of special mention:

HOOKS AND EYES.—Harriet W. R. Strong, Oakland. No. 307,687. Dated November 4, 1884. This hook and eye for fastening garments consists in a double hook, the parts of which are bent in opposite directions, and lie in the same continuous or flat plane, said hook having a stem and double fastening loops, also lying approximately in the same continuous or flat plane with the hooks, and a double eye for engaging the hooks and forming between its parts a spring socket for the reception of the stem of the hook, said eye having a stem and double-securing loops. The object is to form a strong hook and eye adapted by its construction to form a secure and complete engagement, and to lie to a good advantage, being readily concealed.

METALLIC LATH.—John W. Wissinger, S. F. No. 307,803. Dated Nov. 11, 1884. This lath is composed of a strip of sheet metal bent at the edges so that the flanges project outward at any required angle or curve, with the alternate flanges bent so as to overlap the next adjacent ones, while the inner or opposite surfaces of the laths abut so as to form a smooth and continuous surface. Combined with this is a hook and slotted wedge for securing the laths.

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DELINQUENT NOTICE.

The Lamphire Gold Mine and Milling Company.—Location of principal place of business, Room 2, No. 526 Montgomery street, San Francisco, Cal. Location of works, Tuolumne Mining District, Tuolumne county, Cal.

NOTICE.—There are delinquent upon the following described stock, on account of Assessment (No. 1) levied on the third (3d) day of October, 1884, the several amounts set opposite the names of the respective shareholders, as follows:

NAME.	No. Certificate.	No. Shares.	Amount.
Martin, A., Trustee	6	33,320	$3,332 00
Davis, John A.	7	9	90

And in accordance with law and an order of the Board of Directors, made on the third (3d) day of October, 1884, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at the office of the company, Room No. 2, No. 526 Montgomery street, San Francisco, Cal., on Monday the eighth (8th) day of December, 1884, at the hour of 12 o'clock noon, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

ADDISON MARTIN, Secretary.

OFFICE—No. 526 Montgomery St., Room 2, San Francisco, Cal.

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Or E. J. WICKSON, 414 Clay St., S. F.

ASSESSMENT NOTICE.

Gould and Curry Silver Mining Company.

ASSESSMENT No. 40.

Levied	October 25, 1884
Delinquent	November 29, 1884
Day of Sale	December 22, 1884
Amount	Fifty cents per share.

ALFRED K. DURROW, Secretary.

OFFICE—Room No. 60, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

PATENTS. Thousands of Inventors throughout the Pacific Coast can and will willingly attest to the promptness, reliability and success of Dewey & Co.'s U. S. and Foreign Patent Agency. No. 252 Market St. Elevator, Front, St., S. F.

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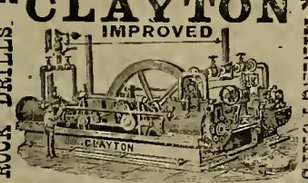

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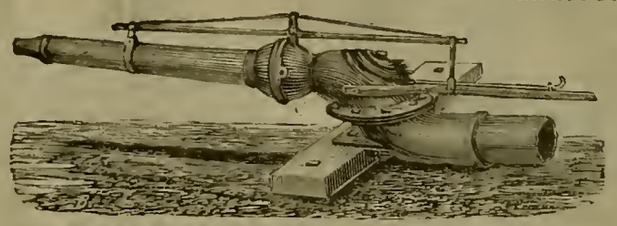

The above cut illustrates the IMPROVED FORM OF HYDRAULIC GIANTS, which we manufacture. All other styles are infringements upon this form, and a judgment stands of record to that effect, under the decision of Judge Sawyer of the U. S. Circuit Court in the matter of Hendy and Fisher vs. R. Hoskin et als.

☞Prices furnished upon application to

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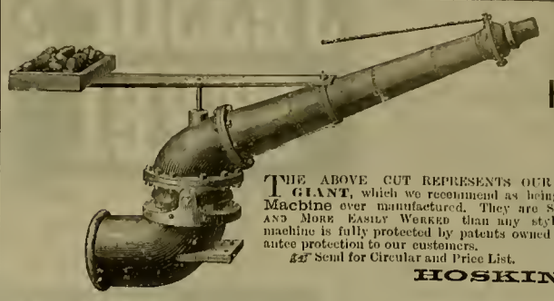

—TO—

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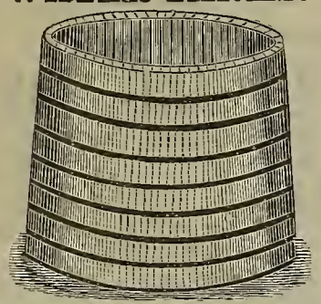
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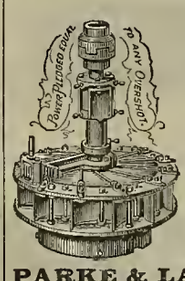
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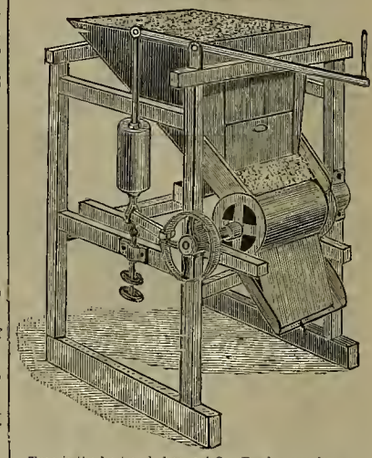
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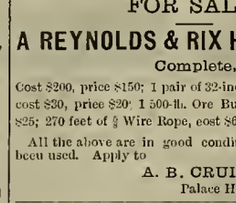

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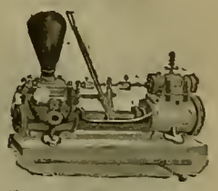
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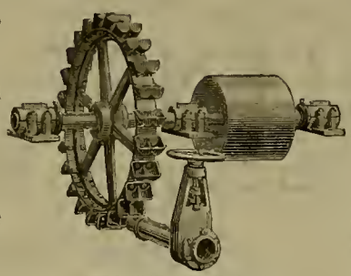
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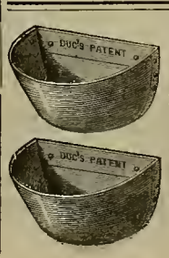

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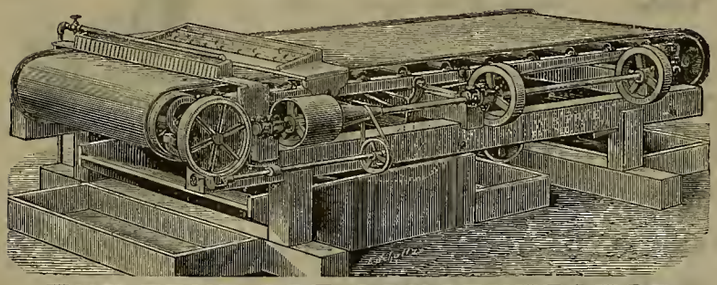

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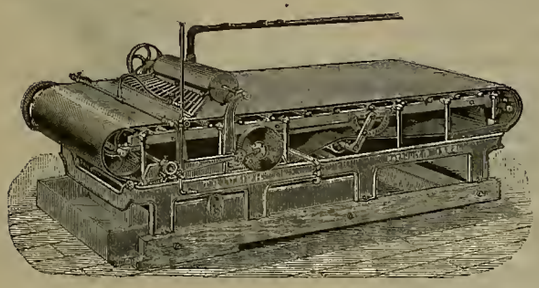

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These returns do not include the value of the amalgam saved by the "Triumphs" during the test; which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarily saved, which is lost on the "Frue" Vanners.

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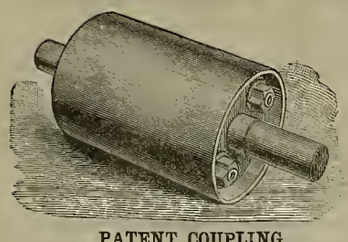

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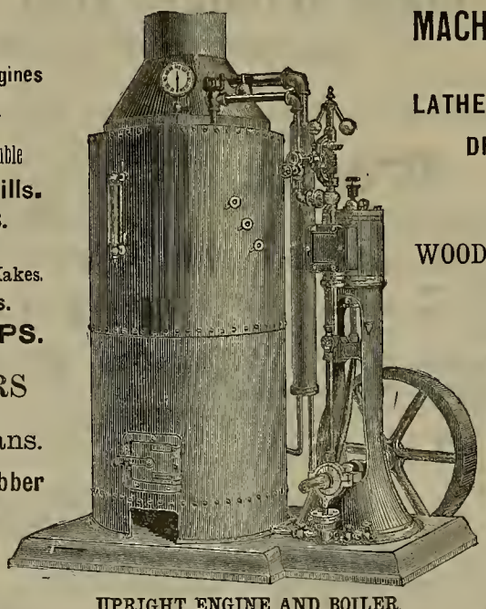

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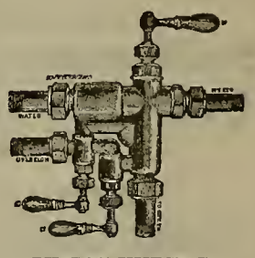

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SAN FRANCISCO, SATURDAY, NOVEMBER 29, 1884.

VOLUME XLIX. Number 22.

The Blake System of Fine Crushing.

The following paper on the "Blake System of Fine Crushing," was read by Theodore A. Blake, M. E., Now Haven, Conn., at a recent meeting of the American Institute of Mining Engineers:

More than a quarter of a century has passed since the introduction of the machine known as the Blake crusher, the invention of Eli W. Blake, of New Haven, Conn. Although originally designed for breaking stone for road-metal, its importance for crushing ores of the precious metals, and those of iron, copper and zinc, as well as emery, phosphates, plaster, etc., was soon recognized, and for many years its use has been world-wide, and its construction so well known that no special description of it is deemed necessary. Following its introduction, many different machines for the same purpose, containing the same essential features of upright convergent jaws, one of which is movable with respect to the other, but having some slight modification of such movement (generally a rubbing motion) or of the non-essential method of imparting motion to one or both of the jaws, have been offered to the public for sale and use, but have, as a rule, in time disappeared from the market.

If we seek for the reason of the success of the Blake crusher, aside from its simplicity of construction, we shall find it in the adherence to the principle of crushing by *simple pressure* and careful avoidance of attrition. In this lies the economy of power and of wearing surfaces.

To reduce any hard and brittle material to a fine powder by many different methods—by attrition, impact, or percussion—is a comparatively easy matter; but to accomplish this by the employment of either of the above-mentioned principles involves such a consumption of wearing surfaces (generally iron) or of power, that the numerous devices that have hitherto been presented to the public as solutions of the problem of fine crushing have proved utter and complete failures when tested with reference to the power employed and the wear of iron in doing their work. Aside from the use of crushers with the harder ores, the only two methods of fine crushing in general use, and, in the writer's opinion, worthy of consideration, are by means of stamps and rolls; the former doing their work by percussion, the latter by pressure, provided they are properly run and fed, but generally by pressure and attrition combined.

It is not proposed, within the limits of the present paper, to enter on a detailed analysis of the comparative economy of stamps and rolls. Of the greater economy of crushing with rolls, as compared with stamps, the writer has no doubt, provided the material to be crushed by the rolls is already broken to a small and tolerably uniform size before being fed to them, and the feed is uniformly distributed in such a manner as to avoid any accumulation of material between them. If fed with such materials their tendency will be to wear evenly, and if accumulations of material between them are avoided they will not be thrust apart, their product vitiated, and unnecessary power consumed.

In crushing, either by stamps or rolls, efficiency largely depends upon the preliminary work with the crusher. To reduce any material fine enough to be fed to rolls, to secure the best economical results, it is necessary that it should be crushed to about corn-grain size, or say a quarter of inch in diameter. When ore is reduced to this size by a crusher it is safe to say that from 20 to 30 per cent of it will pass a 50 or 60-mesh screen; that is, a screen with from 2,500 to 3,600 holes to the square inch. If, then, so large a percentage of the material can, in a preliminary operation with crushers, be brought to such a fineness, why cannot the whole be reduced to the same degree of fineness?

The great difficulties, however, in crushing fine with an ordinary Blake crusher have been the liability of the material to pack in the jaws, and the greatly diminished product of the machine when the jaws are set so as to yield a fine product.

The solution of the problem of fine crushing will be found in making the discharging capacity of a Blake crusher, when set to crush fine, sufficiently great to permit the rapid discharge of the material as it is crushed. This requirement is fully satisfied by the writer's invention of the Blake fine or multiple-jaw crusher—a machine, the value of which, when fine crushing is required, will, in the writer's opinion, prove to be as much greater than that of the ordinary Blake crusher as fine crushing is more difficult than coarse crushing. In the Blake fine or multiple jaw crusher, while the principle of crushing is the same—that is, simple pressure between upright convergent jaws—the discharging capacity may be increased to almost any reasonable limit, even if the crusher is set to crush to a great degree of fineness.

The Blake system of fine crushing, then, consists in nothing more than the use of a series of crushers, beginning with one sufficiently large to receive the largest fragments and to give the required hourly or daily product, and ending with a fine or multiple-jaw crusher, from the product of which that which is sufficiently fine is withdrawn by screening or other methods of separation, and the coarse returned to the same machine to be still further crushed.

The illustrations on this page and page 341 will serve to show the machines employed and the system: Fig. 1 shows the latest and best form of Improved Blake Challenge breaker—a construction that has proved of great and substantial value, not only on account of its sectional character, but also by its power of resisting the enormous and sudden strains to which it is often subjected. A A is the lower timber-frame; B, upper timber-frame; C, clamps; D, fly-wheel; E, pulley; H R, pitman; I, cheeks; J, swing-jaw; K, swing-jaw shaft; N N, main tension-rods; O O, toggles; P P, jaw-plates; R, pitman-rod nuts, for adjustment of stroke of swing-jaw; S, eccentric shaft.

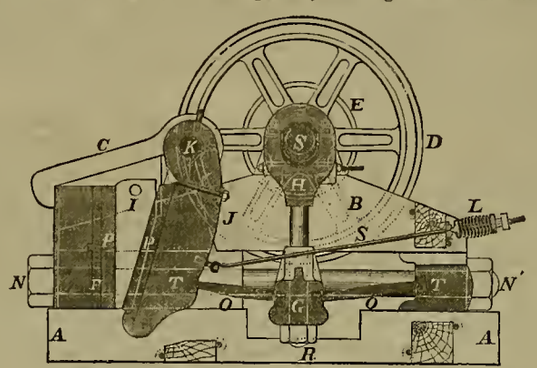

FIG. 1.—THE IMPROVED BLAKE CHALLENGE BREAKER.

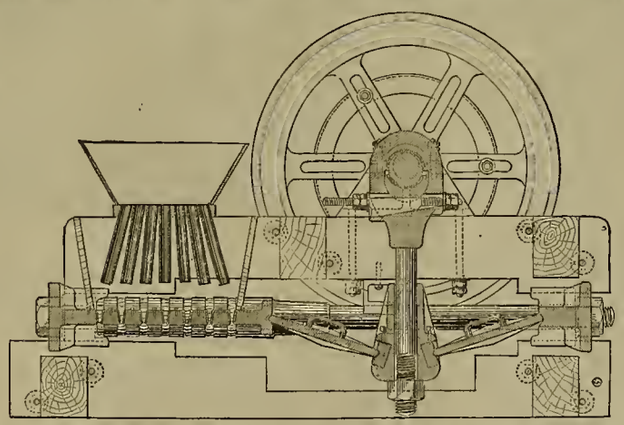

FIG. 2.—THE BLAKE FINE OR MULTIPLE-JAW CRUSHER.

Fig. 2 represents a Blake fine or multiple-jaw crusher, with seven jaw-openings, each twenty-four inches by half an inch, equivalent to a single crusher with jaw-opening or receiving capacity of one hundred and sixty-eight inches by half an inch.

Fig. 3 shows a full-size cross-section of one of the series of sliding jaws in a 24-inch fine crusher, with plates of 1½ by ¼-inch tool steel for wearing surfaces.

Fig. 4 is a longitudinal elevation of one of the series of sliding jaws in the same machine, one-eighth full size.

It will be seen that the crushing is done between a series, in this instance, of sliding-jaws supported by and sliding upon the main tension-rods. These jaws are separated and held by rubber rings placed between them on the tension-rods.

The method of imparting motion adopted is the same as in the regular Blake crusher, by means of the toggle-joint, pitman, and eccentric shaft.

The revolution of the shaft, bringing the toggles more nearly into line, throws the main sliding-jaw forward, thus compressing the whole series of sliding-jaws, the crushing pressure being transmitted through the material to be crushed, with which the jaws are supposed to be filled.

It is evident, that, if a piece of iron or steel should by accident get into one or more of the jaws, the only result would be to render that jaw for the time inoperative, the motion that it would have with respect to the next succeeding one being taken up and distributed through the other jaw-openings.

Fig. 5 is a sketch illustrating the Blake system of fine crushing. In this series the first or single jaw-crusher is a 10 or 7 improved Challenge. The second machine, to which the product of the 10 by 7 goes by gravity, is a multiple jaw-crusher with three openings, each twenty by two inches. The product of the second crusher, reduced to corn-grain size and dust, is elevated to a screen with holes of required fineness, and then screened, the coarse going by gravity to a (24 by ½) 7 fine crusher. The product of the fine crusher goes by gravity to the same pit, and is elevated and screened, the coarse returning to the fine crusher to be again crushed. In this way the entire mass of material may be reduced to almost any degree of fineness, the services of but one man to feed the first machine being necessary. The crushing may be either wet or dry.

It will be seen that, in the above-described plant, as the fineness of the ore increases we increase the discharging capacity. Beginning in the series with a discharge width of ten inches, we jump, in the second machine, to sixty inches, and in the third to one hundred and sixty-eight inches.

The number of single-jaw crushers to be employed in a series may, in some cases, of course be increased with advantage. The product of a 20 by 15 may pass to a 30 by 5, and so on, the discharge capacity rapidly increasing; and any number of fine and multiple-jaw crushers may be employed.

We have in the Blake system, then, a system of crushing with crushers alone, and in the new multiple-jaw or fine crusher the old Blake crusher over again, so far as the principle of crushing is concerned, with an entirely new and completely effectual provision against breakage, due to the multiplicity of its jaws.

The results already attained have been so remarkable that the writer thinks it perfectly safe to assert that the problem of fine crushing has been, by this invention, completely solved; that the days of the old stamp-mill for ores of the metals, and the burr-stone for phosphates and cements, are practically numbered, and that they will shortly be replaced by a machine quite as simple, and even more durable, than the original Blake crusher, which was intended and is invaluable for spalling or reducing ores to a size suitable for further reduction by other means.

The first example of the Blake system is to be

(*Concluded on page 341.*)

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

The Mineral Belt of Amador County.

Some of the Rich Mines on the Mother Lode.

[Written for the PRESS].

EDITORS PRESS:—There has been for the past year, and at present, also, much interest felt in a mining point of view, concerning this particular locality, as it is in the track of the great "mother lode" of gold quartz, that traverses California in a southeasterly course, from Northern California in the western part, until it reaches the Sierra Nevada range of mountains in the eastern part of the State. About all the rich gold mines in California that have as yet been worked, and are being worked to-day, lie in and along this "mother lode" or mineral belt of gold quartz, and anything of a correct and reliable account of its producing mines, is of vital importance to all. It is especially so to the rich capitalists of not only the Pacific Coast, but the heavy-monied men of the large Eastern States and cities, who may wish to invest some of their surplus capital in gold mining, where it will pay the largest interest, as well as being a sure and lasting investment for the coming future. I will here say that from the northern line of little Amador county, on the Cossumnes river, above Plymouth, to the southern boundary of the county, at or near Middle Bar, on the Mokelumne river, which is the line between Amador and Calaveras counties, there is a greater amount of large and productive gold quartz mines and mills being worked, and to-day in active operation, than is to be found for the same distance anywhere else on the Pacific Coast. This is a matter of fact not to be gainsaid by anyone posted in this matter. The three or four heavy quartz mills at and near Plymouth (of Alvinza Haywood *et al*), is all that need be mentioned for that point, as being second to nothing of the kind on this coast. Next comes the Keystone, Lincoln, and one or two other big mines and quartz mills at Amador City, four miles this side of Plymouth, that stand upon an equal footing with the Plymouth mine and mills. Next are the two or three mines and mills at Sutter creek, which is some 2 miles south of Amador City, where the Keystone mines and mills are located above referred to. Next, and south of this point are the Oneida mines and mills, only two miles from Sutter Creek. These mines at present are nearly idle. Next south are the mines and mills at "Kenuedy Flat," one and a half miles south of the Oneida; they are also idle at present; and next, only about one and a half miles south, at Jackson, bring you to the Zeila mines and mills, owned by the late Dr. Zeila, of San Francisco, that, like the Haywood mine at Plymouth and the Keystone at Amador City, are and have been mining for many years as regular as "clock work," and pay their hands and are as certain as the months roll round, and have been so for years. This last mine and mill employs from 100 to 135 men steadily, and crushes from 125 to 135 tons of ore every month. The sulphurets from all these mines and mills above mentioned pay from $150 to $300 per ton, the ordinary quartz running from $5 to $8 and $10 per ton. Next comes the

Newest and Latest Discovered,

And by all odds the richest in native gold metal, which is three miles south of Jackson and at the southern line (Mokelumne river) of Amador county. I may as well add here that one and a half miles south of this point is the very rich Gwinn lead and mines, owned by Dr. Wm. H. Gwinn, ex-United States Senator from California, in "Ante-Bullion days" and times. This Gwinn mine of course is over the line in Calaveras county, and has produced its tens of millions of glittering gold. This mill and mine are at present idle.

But to come back to Amador county mines. This newest of all and as I said by far the richest in native gold metal, was only discovered to be so rich about one and a half years ago by one of the present owners, Wm. A. Nevills, and only about 14 months ago (September, 1883) from a single blast, and less than 100 feet from grass roots, in this Nevills or Mammoth mine, as it is called (though upon the latest county map of Amador, it is put down as the Spanish mine or lead, because of the fact of it being located in Spanish gulch, so called in the early days of '49,) they took out from $80,000 to $100,000 in native gold, the greater part of which was a black arsenide and iron appearing metal with little or no quartz in or about it. Prior to and also after this rich blast from $5,000 to $10,000 and $20,000 have been extracted at a single blast from this Nevills or Mammoth mine. This of course turned the heads of "bonanza kings" and mining men in this direction and the result was that after 100 tons or more of the quartz was taken out under the personal supervision of Senator John P. Jones and others of Virginia City and Gold Hill, Nevada, Messrs. Jones, Hamilton & Wooster, gave $250,000 or a quarter of a million for less than a one-half interest in this very rich Mammoth lead and mine, and in the present year they have been mining a

Large Double Track Tunnel

Of about 9 feet square from near the river at Middle Bar, to cut and strike this bonanza lead and mine at about 1,000 feet from the surface of the grass roots of the lead. They are in over 2,000 feet with this large tunnel, which runs its entire distance, I believe, without a single timber being put into it—in and through the hardest of granite rock and slate the entire distance. This will make one of the very largest, best and finest tunnels ever run into the mountains in all California, which is intended also to work this "mother lode" clear through to Jackson in the future, and even on north to Amador City and the Plymouth mines, some 15 miles in all in distance, when a company of Eastern and Western capitalists will be formed, of twenty to forty million dollars, for the purpose of working these "bonanza mines" in this 15 miles of stretch. Double tracks will be used, and mules or horses will haul the cars out and in, from and through this tunnel, laden with rich gold-bearing quartz to large quartz mills that will be built at Middle Bar, the "coming city" in the near future, of Amador county, California. When, with all these things in a working way there will be quartz mills having their 100 and more stamps each in operation, the constant clatter and clamor of which will make this place (Middle Bar) a perfect Bedlam of "noise and confusion," as General Carr once said in his speech at Detroit, Michigan.

Next let me give you and the readers of your very excellent mining journal, perhaps the very best that is published in all the United States of America to-day, and may it always hold and occupy this position amongst them, I say let me give you a brief description of the location and the topography of this section of the country and this "mother lode" of gold-bearing quartz leads. The Mokelumne river, in all its course, runs through a deep—very deep—gorge of mountains in the foothills of California. The aggregate in hight of these high hills, upon either side of the river, being from 1,000 to 1,500 feet before the comparatively level country is reached, where there are many large and good farms and ranches of from 150 to 500 and 800 to 1,500 acres, that have their fields covered by the cattle and sheep on a thousand hills—(and not, as I once heard a preacher say to his congregation, who wished to make the cattle appear very numerous, that they were as "a thousand cattle upon ten thousand hills," which would be only one head of cattle to every ten hills, or one ox on one hill, and nine hills without any cattle at all upon them). In making this ascent you reach the summit on the Amador county side in about two-thirds of a mile from the river at Middle Bar, when you come to this side of Nevills' or Mammoth lead and mine above referred to, the ascent being regular and steep and curved, and more or less pine and oak timber covers the mountain-side all the way up to the top. Here, as you stand and "about face" to the east and south, also north of you, is stretched out before you one of the finest, grandest, and most extensive and beautiful landscape mountain views that is to be found in all California. Here, for miles up the Mokelumne river, lies a beautiful and magnificent prospect of the rugged rock-ribbed cliffs and hills, with the water of the river, like a broad, silver band, plying its rapid course between, and deep down—dashing in white spray over the rocks in its course; while east of you from fifty to sixty miles, is spread out before you one grand, amphitheater of mountain landscape scenery, of foothill, valley, and the "eternal snow-capped" Sierra Nevada mountains in the distant background, as if painted upon the "blue ethereal heavens," so perfectly do they blend together. After viewing all this extent of "the grand and beautiful" in Nature, you turn about face, and in the "dim distant west," you see the Coast Range of mountains, with "old Mt. Diablo," sitting crowned majestically in among these some seventy or seventy-five miles distant, with the smoke of a dozen or so of trains of cars coming their way, up, down and across the Sacramento Valley, as they meander along their respective lines of railroad track; while just at your feet, and before you, only twenty rods or more, you see in the grove of alpine and other evergreen and ornamental shade trees, a little cottage nestling, that attracts your attention. Naturally enough, you ask: "Who lives here?" to which I answer: Where you are now standing, and the cottage you see near you, is none other than the house and residence of Dr. Chambers, a gentleman who first came to California some twenty-five years ago or more. He owns a ranch of 160 acres of this beautiful and rich land here, and the immediate grounds and surroundings of "Belle Monte Ranch and Cottage" (which is the very appropriate name he has given to his ranch and home, as it is the French for "Beautiful Mountains," *belle* being beautiful and *monte* mountains) can hardly be excelled for Alpine evergreen and ornamental shade trees. The pure mountain air and water that give health, vigor and life to both mind and body, are here to be found and had, and the remark has been made by strangers to the Doctor that this spot above all others, perhaps, would make one of the finest of locations for a high school or seminary of learning in the near future (when these gold-bearing honauza mines are opened up and developed) that is to be found on the Pacific Coast. But last, though perhaps not least, I must mention the fact that just where you are standing upon the summit of this mountain is the gold quartz lead of Dr. Chambers, which joins the very rich Nevills mine and Mammoth lead, and upon the surface of the ground the quartz rock and other indications are identically the same as those on the Mammoth lead at the surface or top of the ground—so much so that the Doctor has called it the Mammoth No. 2. This lead is as yet undeveloped, and I understand that the Doctor will give responsible parties a good interest in this quartz lead and mine who will this winter develop it by sinking shafts for one and two hundred feet and running levels in it from these shafts, which will doubtless find rich gold; ore and metal being the same as found in the rich adjoining mine of Senator Jones and others above referred to. I shall send you further notes of this region next week.

WELLINGTON.

The Sweetwater Mines.

EDS. PRESS:—Having seen in your valuable paper that you are friendly disposed towards prospectors and new mining camps, etc., I take the liberty of sending you the following items in regard to this camp, which you may depend on as reliable:

Patterson District, Sweetwater.

This camp has a number of good mines that produce paying ore (12 or 15). It is on the line of Nevada and California, but mainly in the latter State, and is three by eight miles. The formation is porphyry on the east and syenite on the west. The ores are sulphides and chlorides, and work free milling to 80 per cent. There are two steam mills, although there is plenty of water-power on three large creeks. The district resembles the Comstock in many particulars, as well as the mines in the Cordilleras in Mexico. The range is nearly 12,000 feet above sea level. This camp will come to the front ere long. For what work there is done I have never seen results surpassed in any new camp, and I have seen a great number. There are three or four parallel ledges that can be traced some two or three miles.

The Star Lode,

Up at the head of Sweetwater Canyon, is a splendid property. It is owned by Meagher Bros., Capt. Jones and others. They have recently cut the lode, which is 12 feet wide, of good $75 ore, with a tunnel 100 feet long, and are now engaged in sinking a winze, which is down 50 feet from the tunnel level, and 100 feet from the surface. They have rich ore all the way down in sinking this winze, and have taken out 35 tons that will clear $75 per ton over and above milling and packing. This company will soon resume work on the lower tunnel, which is now in over 100 feet, and will tap the lode some 300 feet deep. There is an east ore front ledge on this ground, from 4 to 6 feet wide and with from 6 inches to 4 feet of good ore, which carries 25 per cent of gold.

Other Mines.

The Home Stake lode, in Silverado Canyon, recently had 22 tons of ore worked at the Kentuck mill in Clinton, which turned out 1,200 ounces of silver, or in the neighborhood of $50 per ton.

The California Comstock croppings are 11,500 feet above sea level. The lode has been stripped for a considerable length and shows a width of 32 feet. When recently sampled by some San Francisco capitalists, it went $84.50 per ton the whole width. The new mill is running on Lady Hayes ore.

The lowest workings of the Kentuck mine are down over 500 feet, with 8 feet of good milling ore, some exceedingly rich. It is the oldest mine in the camp—worked over 2½ years—and has paid well, although the ore has to be packed on mules and worked at a 5-stamp mill. What would it pay had it a wagon road and a 10 or 15-stamp mill? It has produced upwards of $300,000 in bullion.

S.

MILL MACHINERY AND ENGINES.—The Cumner Engine Company report that the Jonathan Mills' flour dresser, manufactured by them, is meeting with excellent success. They are selling a great many of them, and are receiving a large number of repeated orders. They are also quietly placing a number of the "Finch" rolls, which are looked upon by all who have investigated them as a very superior roll. The Cumner Engine Company has just been awarded the contract for the refrigerating plant for the brewery of Rothaker Bros. & Thomas, of Philadelphia. This comprises two of their improved refrigerating machines, two condensers, etc., etc. They have also entered into contract with Henry Zeltner, of Morrisunia, New York, for a large refrigerating plant, including two machines, two coudensers, one of 67 horse-power engines, etc., etc., and have received an order for an engine of the same size from the Montgomery Milling Co., Montgomery, Mo. Among the recent shipments of the Cumner Company are the following: A 95 horse-power engine for the flouring mills of Amos Bros., Syracuse, N. Y.; two engines, 67 horse-power each, for the Citizens' El. Lt. Co., of Akron, O.; a 130 horse-power engine for the Upton Manufacturing Co., Port Huron, Mich.; one of 170 horse-power for the cotton mills of the Hadley Co., Holyoke, Mass.; an engine of 287 horse-power for the railroad shops of the New York, West Shore and Buffalo R. R. Co., at Frankfort, N. Y.; and a 170 horse-power engine for the cotton mills of W. H. Cherry & Co., Mountain Mills, Ala.

Smiley Basin, Idaho.

It is fast being proven, that the mines in Sawtooth district are not mere surface prospects but true mines, as on Wood River. Late proof of this is the encouraging outlook of some of the mines of Smiley Basin. Among them Vienna, Solace, and others. The Idaho *Keystone* says:

In the fall of '78, during the Bannock war, Levi Smiley, Thos. Mulkey and a few others were prospecting on the rim of Smiley Basin (head of Salmon and Boise). Mr. Smiley staked the Emma; Mr. Mulkey the Flagstaff (now a portion of the Solace) Last Chance, Ferguson (joining the Emma on the east), and Telegraph, joining the Flagstaff. Indians were all over the country then, and the prospectors left for their winter homes. The opening of spring brought the same parties to the Sawtooth again, followed by others. A number of locations were soon made, among them the present famous Vienna mine. During the winter following, Mr. C. J. Johnston negotiated for the Vienna group, and soon after commenced to develop them. The results of his industry and sagacity, are a mill sending out bullion daily and the Vienna developed to that degree, that insure the mill successful work for a long while to come. The Vienna company owns a dozen or more locations in the heart of Smiley belt, all patented, on a number of which good ore is found.

The Emma, the first discovery, is, under the new management, proving a fine property. For three years Mr. Smiley worked more or less on the mine, running tunnels, sinking shafts, etc., the work being principally on the east or Salmon side of the mountain. He then sold the property, and the present owners last spring found the vein on the Boise side of the hill, several hundred feet from the apex, and commenced opening. It has proven to be a magnificent mine, and preparations are all made for successfully working it. Supplies are all in for 15 men, for the winter, besides tools, powder, etc. The boarding house will accommodate 10 men, the ore houses are calculated, one for first-class ore, for 350 tons, the other, for second-class ore, for 700 tons. Also a fine assay office, and other convenient buildings for coal, wood, etc., are completed. They have over 300 tons of ore out, extracted in running main tunnel and sinking a shaft.

The developments on the location consist of about 1,100 feet of tunnels; three on the Boise side, started this last summer, the lower one, of which will open the ledge 500 feet from the surface. Tunnel No. 1, 300 feet east of discovery, is in nearly 300 feet, making 170 feet from surface. In the tunnel 200 feet from apex, there has been good ore all the way, with the exception of a break of 30 feet. The ore vein averages about two feet, principally sulphurets and chlorides, with occasional rich streaks of antimonial silver.

No. 1 tunnel strikes the old discovery shaft (which is on the summit of the divide) at a depth of 125 feet; No 2 will tap it at a depth of 240 feet; No 3 at a depth of 500 feet, and raises will be made from one level to the other.

A shaft sunk at mouth of tunnel No. 1 is in ore at surface, and at a depth of 40 feet struck ore that samples 240 ounces and upwards. The Emma is regarded by miners and others who have seen it, as one of the most promising locations in the county, and with its present good showing, almost assures a mill on it the coming summer. It is by odds the best prospect opened on the south Boise side, if not in the whole Sawtooth country, and the new owners can congratulate themselves on the possession of a property that has few equals for the amount of labor and money expended upon it.

EXPENDITURES IN MINING.—Some Eastern people seem to have a very limited idea of the actual requirements of successful mining, for they evidently think that a few picks and a few shovels, with strong men at the farther ends of their handles, are all-sufficient to dislodge gold and silver-bearing earth and rock. Entertaining this extravagant view, they do not stop to think of the ponderous machinery requisite, and the great cost involved in its purchase and transportation to the mines. Before paying yield can be obtained in any mining camp, either gold or silver, large outlays have to be made. This was the case as to Leadville, the richest producing extant; and it is so with other paying localities. Sight must not be lost of the fact that it takes money to make money, and especially is this so in mining camps. Let mining be legitimately conducted with the assistance of adequate means advanced by the masses, and then all who participate therein, whether they be laborer, scientist or stockholder, will receive large and lucrative returns within a reasonable season of outlay.—*R. M. Mining Review.*

PAPER MILL WANTED.—A premium of $30,000 says the *Paper World*, has been offered by the Mexican Government to any one who will establish in that country a paper mill at a cost of $150,000. The Government will also concede the right to all cactus plants on the State lands.

ASSESSMENT work on mining claims will be the next thing in order. Do not fail to retain your good prospects, as the indications are that the coming year will be an active one so far as investments are concerned.

MECHANICAL PROGRESS.

Accurate Mechanical Work.

In a lecture delivered before the Franklin Institute a short time ago and recently published, Mr. George M. Bond spoke of the modern accuracy in the work of the machinist as compared with former crudity. James Watt, in a letter to a friend, claimed that he had attained remarkable accuracy in boring a cylinder of a steam engine and fitting its piston so closely that "the thickness of a half-crown could not be introduced between them." Standard gauges are now made that show errors of one one-hundred-thousandth of an inch, and work is exacted to one fifty-thousandth of an inch. Such accurate work is not, however, generally necessary, except in the construction of gauges; but these standard gauges are the means provided for keeping within proper, useful and practicable bounds in the production of thousands of pieces of the same size and shape in which oftentimes a certain amount of variation is allowed both *plus* and *minus*. A certain amount of looseness must be allowed, for instance, in the fit of journals and bearings, the amount to be determined according to the length and size of the journal; but this variation should be referred to some particular gauge as a standard.

This allowance of difference is necessary in the fittings of bearings and journals, as if made with the extreme accuracy of gauge work, the surfaces would cohere and speedily destroy each other. This is seen in the construction of end measure pieces as gauges; where two are pressed together by their ends, they will cohere even in a vacuum. In the perfect fit of plug and ring gauges where the plug is inserted in the ring, both being of hardened steel and both at the same temperature, it is necessary to keep the plug moving, or the easy sliding fit will change to a driving fit. In fact, there is no room for one to expand and not the other. A plug gauge of three-quarters of an inch diameter, but which is three ten-thousandths of an inch smaller than the ring, is a loose fit which can be tested by feeling; and if the plug and ring are clean and of the same temperature, the plug will drop through the ring.

In order to make standard gauges within the limit of accuracy necessary for interchangeability, to fulfill the requirements of modern shop practice, line measure is the best standard for practical reference. This measurement is by means of engraved lines on a ruled steel bar, the tests being made by the microscope. For this purpose a hardened bar of steel is used, the subdivisions being ruled or engraved by a diamond.

Composite Steel and Iron.

According to the recently published statements of a master railroad car builder, the union of ordinary machinery steel strap with iron scrap in making a pile for forging into bars, is ruinous to the entire work. The bars showed handsomely on the surface, but when broken the fracture showed that the metal was unsound and not homogeneous; the steel and iron had not welded. In some of the bars the flaws were in the form of wide cracks, while in others there were seams completely separating the two metals; true welding had nowhere taken place.

If this result of experiments, says the *Scientific American*, is to be received as conclusive, working mechanics must have been greatly mistaken in their estimates of machinery and other low-steels. The general belief has been that these steels were so scarcely removed from iron that their union by welding was one of the easiest of processes. We find no difficulty in uniting by welding the highest cast steel with iron; all our large cutting implements are so made; and the union of the two is not a mere cementing or gluing together, but is a chemical combination. It is somewhat singular (if it is true) that low steel and iron cannot be thoroughly united under the influence of the welding heat and the compressive action of making a bar from a fagot. Certainly such a union is possible; for in the ordinary scythe there are three equally longitudinal strips of iron, low steel, and crucible steel, and it would be difficult to find cracks or seams in any one of the thousands of scythe blades turned out every week from the factories of Western Connecticut. The report of the master car builder was probably based upon imperfectly recorded experiments.

A HAIR'S THICKNESS—A DELICATE MEASURING INSTRUMENT.—The Post Office Department at Washington recently cancelled a contract with an envelope manufacturing firm for not furnishing the precise article, in matter of weight, contracted for, and, according to one of our contemporaries, a curious little machine in the office of the Chief of the Stamp Bureau was the cause of the cancellation of the contract. It is a queer looking contrivance—a cross between a set of butcher's scales and ordinary grocer's scales, or rather a combination of the two. There is a large dial, like the face of a clock, with a little hand that flies around the face, pointing to the figures at the side, which are arranged like the figures on the clock face, with little dots between. "You see three dots?" said the gentleman in charge, inquiringly. "Well, the space between those indicates one sixteen-thousandth of an inch. Getting it down pretty fine, isn't it? You see this movable piece of iron here, which comes down with a smooth surface upon this other solid surface? Well, the raising or lowering of that moves the pointer which runs around the dial. To test the thickness of a sheet of paper, we simply place it between this movable piece and the solid surface below, and when the movable piece of iron comes down upon the paper, the hand registers the true thickness of the paper. Delicate instrument? Well, I should think so. Just give me a hair from your head, will you?"

Then he took a hair and slipped it deftly between the movable pieces. The hand on the dial followed the motions of the screw until it stopped at the figures 20. "Just twenty sixteen-thousandths of an inch in diameter," he said. "Now let me try a hair from your mustache? They are generally much larger, especially if you have been in the habit of shaving." He took up a pair of scissors, and clipped off a hair from the mustache and placed it in position. The hand stopped at 50. "Fifty sixteen-thousandths of an inch thick," he said. "That shows the effect of shaving. I measured a hair from the hand of a gentleman a few minutes ago which was forty sixteen-thousandths thick, but those in his mustache were precisely the same thickness, the reason being that he had never shaved. Yes, that is the machine that proved that the firm making our envelopes was not fulfilling its contract," he said, as he fell back admiringly.

This delicate instrument, only recently invented, is a companion piece to the scales in the Assayer's office in the Treasury, by which the weight of a hair is accurately tested.

A REMARKABLE STRAIGHT EDGE.—Some notice was made in the *Scientific American* of March 29, 1884, of a trio of remarkable straight edges made by the Pratt & Whitney Company, Hartford, Conn., which are each 12 feet long and wonderfully exact. These straight edges are castings of iron, forming a chord and a segment of a circle, the extreme radius in the center, from the chord or straight line to the highest point of the curve being 20 inches, the depth gradually tapering on a curve. The width on the face is about 2½ inches, making a face 2½ inches by 12 feet. Between the chord and the curve the casting is a honeycomb of diagonal braces. Recently some remarkable tests have been made with these straight edges, one of them being a test of flexture. The straight edge was placed on a true and perfectly clean planer bed, with a slip of tissue paper under each end. These slips raised the entire straight edge, so that another slip of tissue paper could be moved under its face from end to end. Then a man weighing 220 pounds sat on the center, without deflecting the straight edge a particle. But in order to avoid all opportunity for error on account of the possible inequality of the planer platen, two of the straight edges were placed face to face, one on the other, with the shims of tissue paper between, and the superimposed weight of a heavy man, with the same result. The middle slip of tissue paper could be slid between the two faces at any point between the end shims. It is doubted if better accuracy has ever been secured.

RESTORING BURNT STEEL.—At the Nuremberg Technical School, a series of attempts have been made to restore the original quality of steel, after it has been burnt in the forge. These tests have been carried out with the various classes of steel in common use for tools, with varying degrees of success. Sometimes this accidental burning can be repaired by hammering the piece of steel while hot, but more generally it is only worth returning to the scrap heap. The alteration known as burning, is due to a more or less considerable decarburation of the metal. Among the processes that have been devised for restoring burnt steel, the following has given excellent results: The piece of metal is brought to a red heat and suddenly plunged into a mixture compounded as follows: Pitch, two parts; train oil, two parts; tallow, one part; with a small addition of common salt. This operation is repeated two or three times.

AN INVENTION NEEDED.—The inventor who will devise a cheap, speedy working-power press which will press straw into small solid blocks to furnish fuel for our vast, woodless tracts of wheat country, would surely enrich himself. Such a press, if practical, cheap and durable, would confer a great blessing upon grain growers. Millions of tons of straw are now burned to waste, which, by such a device might be converted into valuable fuel. Our present straw-burning engines, although valuable, do not fully fill the bill.

IMITATION OF CEDAR.—German technical papers recommend the following mixture for the staining of wood in imitation of cedar: Two hundred parts of catechu, 100 parts of caustic potash, and 10,000 parts of water, all by weight. The longer the wood remains in this solution the better the stain penetrates its fibers, and thick veneers can in this way be stained right through the whole thickness, which permits a refinishing without injury to the color.

LUMINOUS key-hole trimmings and door knobs are said to be in great favor with the habitual inclined person, and convenient for others. They are made of glass, and the back is covered with luminous paint, giving forth a light which may be seen considerable of a distance on the darkest nights.

SCIENTIFIC PROGRESS.

Psychical Research.

A society was formed in London some three years ago with the view to entering into a scientific research into psychical phenomena. In their report for 1882 they said:

"It has been widely felt that the present is an opportune time for making an organized and systematic attempt to investigate that large group of debatable phenomena designated by such terms as mesmeric, psychical and spiritualistic.

"From the recorded testimony of many competent witnesses, past and present, including observations recently made by scientific men of eminence in various countries, there appears to be, amidst much illusion and deception, an important body of remarkable phenomena, which are *prima facie* inexplicable on any generally recognized hypothesis, and which, if incontestably established, would be of the highest possible value."

It is understood that phenomena which are inexplicable on any generally recognized hypothesis will, in time, be examined by this organization on a new basis of facts. In other words, manifestations which are now held to be supernatural will be investigated on the assumption that they are natural, but hitherto misunderstood. There are two classes of minds which stand in the way of useful results from such investigation. One class attributes every unusual form of manifestation to a system of tricks based upon well-known natural laws, and the other perceives a mysterious agency in everything not comprehensible to the bodily eye. The remarkable strength of Sullivan, the prize-fighter, may be accounted for in his peculiar structure; but such feats as are performed by the so-called Georgia Wonder are ascribed either to tricks or to the exercise of supernatural powers. Probably the discovery will be made in time that the difference between the natural and the supernatural is precisely the difference between what we know and what we do not know.

It is now proposed that a similar society to that in London be organized in this country. To this end a meeting was held in Boston, on Sept. 22d. Prof. W. F. Barrett, Vice-President of the English society, was present, and gave an account of the work they are doing in England in the investigation of "mind reading" and the so-called spiritualistic phenomena, which last they always find to fail when the medium is securely bound. As one good result of the English society's work, it was stated that there had been a decrease in the activity of the society of spiritualists in London. It was the sense of the meeting that if anything could be done in this country to check the growth of the belief in the supernatural powers of "mediums," and to show what is the true explanation of such phenomena as "mind-reading" and mesmerism, it would be a work which should enlist the assistance of American scientific men. Prof. Barrett showed that, in the case of "mind-reading," most of the results pointed to an unconscious guidance on the part of the person whose mind was being read, but there were residual cases he would not so explain. It was the opinion of those present that the collecting of the stories of fulfilled dreams and anxieties would be fruitless, but that there were many questions of a physiological nature which should be investigated, and no longer be allowed to go unanswered or ignored. A committee was appointed to consider the whole matter of the formation of a society, or in what way it may seem best to undertake the work, and, at a meeting held last week, steps were taken for the formation of a society in America, of which we hope soon to report the complete organization.

There is room for a good many workers in this field. A great many forces are at work that we really know little about. The so-called magnetism of a public speaker or actor is a power which no one can define. It is not always brain force, for it is possessed by people who have no superiority in the way of brains. It certainly is not physical beauty, for it is often possessed by very plain men and women. There are certain people who possess a mysterious power over certain other people. When these phenomena are examined by minds from which all love of the marvelous and all belief in the supernatural have been banished, some principles may be discovered which will throw light on the phenomena at present inexplicable on any generally recognized hypothesis.

"SCIENTIFIC."—The use of the word 'scientific' at the present time, illustrates how custom overrides etymology, giving sanction to an application of a word quite inconsistent with its derivation. 'Scientific' means, strictly, 'knowledge-making;' but it is employed to signify 'relating to, or in accordance with science.' Last week we reviewed a work on 'scientific butter-making.' Now, if we could, by any process of manufacturing butter, produce science at the same time, everyone would agree that it was an eminently practical and economical invention; but alas! the true Anglo-Saxon defies etymology, and nobody will misunderstand the customary meaning of 'scientific' in adjectival association with butter-making, or when used to qualify much else, which never makes knowledge. The word is a curious example of error becoming correct through usage. If we could only add the word 'sciential' to the language, usage might then conform to etymology, in regard to 'scientific,' by transferring half its duties to the new adjective.—*Science.*

FAYE'S COSMOGONY.—Faye supposes that the primitive nebula had no central condensation, but that it was nearly homogeneous and spherical, not rotating, but having feeble interior gyrations in a given direction. Under the influence of internal gravity these slow gyrations formed rings, nearly in the same plane. These rings successively gave rise to planets, beginning with the smallest, which was nearest the center. The rotations of the planets and the circulations of their satellites were thus all direct. During this time a central condensation was going on, becoming gradually more rapid. When the sun had absorbed all the nebula except the planets and the exterior rings, gravity, instead of varying directly as r, varied inversely as r^2. Uranus and Neptune, which are both in the form of rings, were forced to take a circulation in conformity with this new law. Neptuns was entirely under this law; its rotation and that of its satellite were, therefore, markedly retrograde. Uranus was still partly influenced by the primitive nebular rotation so that its rotation is neither direct or retrograde, but its equator is nearly perpendicular to the plain of its orbit. This hypothesis supposes the earth to have been formed before the sun so as to give geology and the natural sciences the use of all the solar heat in terrestrial organization. It also recognizes comets as parts of the solar system.—*L'Astronomie, June 1884.*

THE ELECTRO-CHEMICAL AND THE THERMIC COLORED RINGS.—If we expose a plate of copper to the flame of a spirit lamp, of a Bunsen burner, or, better, to the fixed and narrow jet of an enameler's lamp, there are produced upon the metal iridescent corona around the heated point. If the experiment is well managed there are obtained fixed colored rings, apparently inalterable in the air. These thermic rings are quite similar to the electro-chemical rings of Nobili; like them they follow one upon another, and are propagated in waves. In both cases the colors succeed each other in the same order, which is that of Newton's rings as seen by transmission. Multiple thermic rings may be produced by means of drums surmounted by 2, 3, 4, etc., gas burners. These same pieces serve equally for the production of the electro-chemical rings, by fixing in the fine openings of the tube needles of steel of equal length for each system. The thermic rings, simple or multiple, approximate the more closely to the corresponding electro-chemical rings as the jets of flame are feebler and less oxidizing.—*O. Decharme.*

CHEMISTRY.—There is no department of modern science that receives a larger share of attention than that of chemistry. The tendency of present effort and thought is toward analysis. Everything must be subjected to the disintegrating process. If anything by common consent is pronounced good, it must be taken to pieces, that its construction may be understood, and so the better appreciated; if it does not meet with general favor, it still must be dissected, and its constituent parts subjected to the closest scrutiny. Hence we see students in the various departments of natural science and biology resort to a careful investigation of the primary elements of matter, that they may thereby gain such information as will substantiate their theories. If, in addition to this, we consider how much this science of chemistry has benefited the world in the various departments of the useful arts, we can readily understand why so much attention is being given to it by the students, and why so many new works appear on this subject.

ELECTRICITY IN FRUIT GROWING.—The efforts of fruit growers to guard against danger from frost may be greatly assisted by a device lately suggested by the French scientist, M. Lestelle. A thermometer, placed in a battery circuit, is so arranged as to close the circuit when the external temperature approaches the point of danger. A commutator, moved by clockwork, transmits the current of a small Ruhmkorff coil into a series of circuits. An ingenious lighter carries a match, which is kindled by the induced current, and a fuse of gun-cotton, which lights several fires almost at the same instant. These fires are provided with materials which produce clouds of smoke and ward off the frost.

VARIABLE BRILLIANCY OF NEPTUNE.—Maxwell Hall has made numerous observations at Jamaica, which show that Neptune is of a bluish tint, and that its brilliancy undergoes periodical vibrations, in cycles of 7 h. 55 m. 12 s., which are probably due to rotation. He calls attention to the remarkable succession of planetary hues, corresponding to the spectral colors—Mars red, Jupiter orange, Saturn yellowish green, Uranus light green, and Neptune bluish. Prof. Pickering has made numerous photometric measurements, at the observatory of Harvard University, which show a variation of brilliancy between 7·6 and 7·9.

ELECTRICITY AND VAPOR.—According to the experiments of L. J., there is no evidence of the development of electricity during the conversion of water into steam, even upon quiet electrified surfaces the steam which arises is electrically neutral. S. Ralisher has also shown that no electricity is developed by the condensation of atmospheric vapor.—*Dingler's Journal.*

MINING AND SCIENTIFIC PRESS

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Passing Events.

The people of the United States have passed one day this week in thanksgiving for the blessings showered upon them and their country by Divine Providence. The wheels of commerce and trade ceased rolling for one day, that all might indulge, according to their fancy, in rest and recreation, feasting and religious observance.

The most important news of the week to the mining community is that detailed in another column, concerning the decision of the Supreme Court in the famous debris case, in which Judge Temple's decision is sustained on appeal. In effect, "the perpetual injunction does not restrain the miners from conducting business in a careful manner, and any means to that end are lawful." That is, if they can restrain the coarse material they can go on.

The New River mines, in Trinity county, in this State, are attracting great attention just now, some very rich quartz having been found. The whole region thereabouts is being very thoroughly prospected.

THE Calico mines, San Bernardino county, have shipped so far this year bullion valued at $775,903.

THE Arizona Smelting Co., are going to put up sampling works at Dagget, San Bernardino county, Cal.

ALL the little water mills along Six-mile canyon, near the Comstock, are hammering away. They support many persons, first and last.

A Word About Steam Boilers and Engines.

Now that the season has closed for the thrashers, and the engines are put away until the next season's crop shall he ready for thrashing, and the power of steam shall again he called upon, a word of advice to those having charge of the engines may not be amiss. You have been running your engines three or four months, and in that time you have noticed from time to time that some holt has become slightly loose, and that some seam of the hoiler has commenced to leak, hut in the little resting time you have had during the week from dark until daylight you have had no opportunity to make any repairs, and on Sunday you have heen too tired to do anything hut that of the greatest necessity; and you find when your engine is to he housed for the next seven or eight months that there are many little points which you have made up your mind that you will attend to and "fix" when you get over the season's work. But when the laying up time does really come you are pretty well worn out with the labors of the season, and then you say, "I will rest awhile and then I will go over the "machine" and put in order all these little things that have got out during the run. As the time goes on, however, and you get rested you hegin insensihly to forget some of the many little johs which you were going to fix, and so it goes on until you reach the point of either doing nothing at all or only perhaps running the water out of the boiler and throwing some old sacks over the engine. Then when the engine is required again the next year, a cursory inspection finds everything about the furnace covered with rust—dirt in all the corners, all the bright work rusted and pitted with rust holes, and a general air of dilapidation pervading the whole machine, which would not be shown in years of use with ordinary good care and attention while running.

You find all the waste and pit cocks stuck so hard that there is danger of hreaking them if you attempt to turn them; the safety valve is frozen to its seat, or the seat is full of rust pits; all the stuffing boxes have the sacking rusted into a mass on the rod or stem, and on taking this out you find the rust has so eaten the rod or stem which the packing surrounds that it becomes necessary to take out the stem and have it turned off. The grease which has gathered about the engine and hoiler when at work, and which might at that time have heen easily taken off, has hecome hardened and now requires a chisel and hammer to start it.

A look into the furnace shows a state of affairs about as ancient in appearance as some of the huts of the "cliff dwellers." Ashes are piled up on the grate hins, the corners of the furnace are heaped up with them, and the moisture which has come from some leaky tuhe, or joint, or rivet, has with them made the surrounding metal a surface of rust which comes off in scales when a commencement is made to clean the place. The tuhes have a lot of soot in them, and this, too, has heen at work silently, hut, nevertheless surely, to the serious detriment of the tuhes.

All these things, and many more, will be seen if the engine is put away without a thorough cleaning out. When you come to take out the hand-hole plates, you may find the water spaces alongside the furnace partially filled with a deposit of lime, and prohahly the sides of the furnace sheets will have a thick coating, which has accumulated from the water which has been used, and you have not either had the time to clean out, or when you have had a spare day in which this might have heen done, something which has heen going on outside and is continually before your eyes, seems at least of more importance than what you only see when you take out the hand-hole plates and make a careful inspection inside.

When the season for thrashing is over, and your engine is to be laid up for six or eight months, first of all run out the water, and, opening all the hand-holes, clean out with scraper and hrush all the seale and sediment you can reach; and if you are situated near a water tank, so that you can get on a hose with pipe, use that freely, washing out all the corners that can be reached. Then put in the hand-hole plates, fill the boiler up full to the safety-valve, and let this remain while you are examining and putting the engine in condition for its restiug spell. First empty all the oil-cups, clean them, and then put them so that you may screw them back again into their proper places when you have examined eaoh hearing and cleaned it; and when you have done this, oil each bearing, turning it round, or, if a slide, moving it its length, so that every part may he luhricated; then place back the oil-cups.

Take the packing out of all the stuffing-hoxes for piston-rod and valve-stems, cleaning the hoxes out thoroughly, and oil the portions of the stems and rod which lie in the stuffing-hoxes, laying in a layer or two of well-saturated cotton wick or hemp packing, using mineral oil. Then replace the glands, and when you come to take out the engine again for next year's work you will not find rings of rust around the stems and piston-rods, which might necessitate taking out the rod and an expense to bave them turned in the lathe. See that the governor is cleaned in every part, and well oiled. Take off the goveruor helt and wind it up around the governor pulley. Take the packing out from arouud the pump plunger, and get all the water away from it; wipe and oil the plunger, and put some clean, well-oiled packing into the stuffing-hox, and you wou't he likely to have a pump next season that will every day call on you to repack it on account of a rough, rust-eaten plunger. See that all the soot is cleaned from the tuhes and smoke-box, and then shut up the furnace, sweep out the smoke-pipe, clean out the ash-pan.

Cover with cloth the slides aud governor, and see that that the water in the hoiler does not quite come up to the safety-valve. See that the seat and valves have a good oiling, and when you have done these things you may feel, that so far as cleaning up the engine and leaving it in condition for its long rest, you have reasonahly done your duty.

If you have noticed any work which is needed in the way of repairs, it should be done at this time, as in the long interval between one season and auother you wouldforget many things necessary to be done, and in starting up again a delay would occur prohahly after you had got out into the field, which in all probahility would cost twice as much to repair at that time as if done when engine is laid up, and in addition to this would he the enforced idleness and cousequent loss of time of those employed around the engine aud thrasher. Take this ordinary reasonahle care of your engine, and we shall have less of explosions, with the attendant loss of life as well as injury to limh.

An Air-Blast Amalgamator and Concentrator.

A caveat has heen filed by Henry D. Lightner, of this city, on a method of amalgamating, precipitating and concentrating pulp or any material held in suspension, and which it is desired to precipitate, such as gold, silver, amalgam, or any metals or ores that may he held in suspension in water in fine particles, and which it is necessary to precipitate to the hottom for amalgamation or corcentration purposes.

This is done by the employment of jets or currents of air or steam, which are thrown downward upon the surface of the liquid in which gold, silver, amalgam or any ores may he held in suspension, the action of these jets or cnrrents heing to precipitate or throw the fine particles down to the bottom, where they may be amalgamated hy a hody of quicksilver, amalgamated plates, or other devices for that purpose, and the concentrated ores conserved for reduction purposes.

This application of an old and well-known principle to amalgamation and concentration purposes has at least the merit of novelty, and the inventor's arguments and reasoning in its favor will strike the millman as practical; and should the new machine do all that the inventor claims for it, he has at last discovered or made the application of a principle that will come in strong competition with others now in use for that purpose. It is easily applied, requires but little power, and is inexpensive and effective in its work.

The currents of air or steam are thrown downwards from suitably construeted pipes on the surface of the pulp, that flows over the amalgamated, copper-lined aprons or sluices that conduct the flow of the pulp from the hattery. It is claimed tbat this will not only precipitate all metals or minerals, such as fine scale, feather or float gold, amalgam, or commiuuted quicksilver that would otberwise be lost, but also serve as a precipitate for the sulphurets or oxides held in suspension in the fluid. It is a fact well known that the specific gravity of iron is greater than that of quartz, yet iron filings, under certain conditions will float on tbe surface of water, while the finest particle of quartz from its peculiar shape, will sink in still water, for the reason that a film or globule of air or vapor may he attached to the iron or scalc of gold or feathery amalgam, while no air can attach itself to the particle of quartz, from its rounded or angular form. The same effect is observed in running water through long lines of sluices and over ordinary concentrators, causing a great loss to the mine owner. It is also well known that minute particles of gold remain suspended in water for hours, or even days, hut when a jet of air is thrown on the surface or in the water the particles immediately are precipitated to the bottom. Every miner has noticed that the effeet of a puff of air from the mouth, thrown on the pulp in a horn-spoon or on a particle of floating gold, is to send the gold immediately to the hottom, and that it materially assists in preeipitating the pulp held in suspension. But, strange as it may seem, this principle, so long and well known, has never heen practically applied on a large scale. It is eustomary to beavily grade the sluices that contain the amalgamated copper plates, in order to allow a free flow of the pulp and prevent clogging; but the air or steam jet, properly applied, is found in practice to obviate this difficulty. The plate can he set at a small angle of inclination, if not perfectly flat, and contain a flow of quicksilver on its surface without loss. The jet will cause a current and remove the dehris, leaving the gold, which, by its gravity, finds and follows the hottom, and readily amalgamates with the quicksilver on the plates.

For concentration purposes oue machine of proper dimensions will he sufficient to handle the pulp from any numher of stamps, as the sluices from each battery can he made to tail on to one hroad revolving helt, similar but wider than the helt used by the Frue or Triumph concentrators. A strong current of air should be thrown diagonally across the surface or the flow on the belt, causing a cross current (quartering), which will serve to break, check aud retard the flow, precipitating the heavier and valuable partieles, whioh will adhere to the belt which conveys them to a receptable or reservoir made for that purpose.

This theory is demonstrated in practice on a mammoth scale in the auriferous sands of the sea-beaches of Oregon and California, more particularly at the Gold Bluff heach, below the mouth of the Klamath river. Here can he seen eight miles in length of Nature's great coucentrator in full operation, precipitating and concentrating from her boundless stores of gold-freighted sands that line the bottom of the ocean at this point, on the same principles and in the same manner as the newly invented machine of Mr. Lightner proposes working out the problem of concentration, though on a much smaller scale. On these heaches the roar of a thousand-stamp mill is but as the feehle wail of the new-born infant in comparison with the tremendous thundering of the surf as it broaks aud dashes against these perpendicular bluffs; and the disintegrating and grinding effects of these mechanical forces are in the same comparison on these beaches. Strong westerly winds cause long, rolling swells, which on reaching soundings forms the "ground swell," gathering from the sea bottom and carrying in suspension masses of auriferous sands that form the floor of the ocean at this point. These sands *in situ* are not rich enough in gold to have any economical values like the mass of pulp from the hattery of a quartz mill. They are hy the incoming surf dashed upon the beach. The receding wave forming the undertow removes a portion. A portion remains, and successive waves add to its thickness; as yet there is no concentration, and the sands are valueless from their poverty in gold, hut let a hrisk quartering wind spring up from the northwest or southeast, and it serves to hreak up the carrying power of the receding wave and will form eddies. The heavier particles of magnetic iron, platinum, iridium and gold will from their gravity be precipitated, and fall or remain on the bottom and shore line in strata, while the undertow will carry off the lighter and worthless sands seaward, leaving on the shores coucentrations of great value. The next ground swell from the deep, below the influence of the quartering breeze, hrings fresh masses of gold-freighted material in suspension, which is in its turn concentrated and gathered hy the "heach combers," who are on the watch for these deposits, and the gold extracted by machines used for that purpose. As will he seen, the inventor of the Eureka has heen a close observer of Nature's concentrating works, and like Newton with the apple, thiuks he has solved the problem of amalgamation and concentration.

The Blake System of Fine Crushing.

(Continued from page 337.)

found at the works of the Chateaugay Ore and Iron Company, near Plattsburg, New York, of which Mr. A. L. Inman is the general manager, where the writer designed and placed a crushing plant of the capacity of two hundred tons a day, from 10 inches to a size to pass a one-quarter inch round hole. The works were run continuously, day and night, for six months, giving even an excess of the daily product required, but are now idle on account of the dullness of the iron market. The ore is magnetic ore in grains, disseminated through a tough feldspathic gangue. Works for the same company, of a capacity of 1,500 tons per day, are in contemplation.

The second example is at the works of Messrs. George H. Nichols & Co., or Laurel Hill Chemical Works, of which Mr. J. B. F. Herreshof is the manager, where a small plant, consisting of one 10 by 4 improved Challenge, and one (24 by ½) 7 multiple-jaw crusher, was put in to crush copper matte. The requirements were one ton an hour to twenty fine. The machines replaced an 8 by 12 Dodge crusher, and a pair of 24 by 12 Cornish rolls, of which the product was but about 500 pounds an hour to 20 fine, while the product of the Blake system, with machinery about one-third the weight, was 3,000 pounds an hour, with an expenditure of less than one-third of the power required by the crusher and rolls.

The third example is at the works of the Orford Copper and Sulphur Company, Bergen Point, New Jersey, where a duplicate plant to that of No. 2 has just been installed. Other plants for gold ores, phosphatee, etc., are now on the way to destination for installation.

The results attained have already assumed such importance that I have deemed it desirable to announce to the members of the Institute the introduction of this new machine. I hope before long to give them the results in a more complete form, with comparisons of other methods of crushing, based on actual and accurate statistics.

Flue Dust.

Flue-dust is one of the most important producte of lead smelting aside from the lead, as it is the finest, and in some cases the richest, particles of the ore in admixture with the dust of coal and coke, it is of course worth while to save and re-work it. Where much fine ore is smelted, as was the case in Eureka during several seasons, the formation of flue-dust amounte sometimes to 15 per cent. of the weight of the ore. In the face of this, it is to be wondered at, that so many hundred, and even thousands tons of flue-dust were allowed to blow away, before any provision was made for raising it. The Richmond Co., at Eureka, were the first to go to work in earnest to build spacious flues for catching the dust escaping from the furnaces, the previous attempt at the Ruby Consolidated Works having been a failure. The great question heretofore, has been to get the flue-dust in each a form that it will stay in the furnace and not be blown out again. Simply smelting it is not much use, and is even injurious to the furnace, as it will form wall accretions which grow thicker and thicker very rapidly. Mixing it with slacked lime, has also its drawbacks, as it contains coal dust, which has a tendency to counteract the agglutinating power of the lime; therefore, from eight to ten per cent. of lime is at least necessary to make a mortar which will harden. Mr. O. H. Hahn, an authority on this subject, has found that sulphate of iron—the copperas of commerce, is the best agglutinator, but it could only be used where it is cheap. Thoroughly incorporated with a solution of copperas and made into bricks, which are dried in the sun, the flue-dust becomes as hard as rock, and is in the best shape for smelting. Mr. Hahn once suggested, in 1878, the use of a brick machine to make the flue-dust into adobes with lime, but the season was too far advanced, the bricks froze and on thawing burst, and the experiment was given up. At the Germania Works, the flue-dust was sintered in a roasting furnace, which is the best, but not the cheapest way. The most common way now, is to work it up with lime, and use it along with ore, as fast as it is made.

"Weighing the Bead."

(Written for MINING AND SCIENTIFIC PRESS by C. H. AARON).

A very intelligent young chemist in possession of my book on assaying gold and silver ores, while kindly saying that it is the best book for students that he has ever seen, with equal kindness indicates a few points in which he thinks it might be improved. Among other things he says, in reference to the article on weighing the bead, page 72, "I have always thought, and experiments showed it, that when weighing by the use of the ivory scale (by the oscillations), that, counting from the second swing of the pointer, the difference between the divisions marked on one side and those marked on the other was the correct amount of the preponderance of one pan over the other, not the *mean* of the two. If, on the second swing, the pointer went four and a half divisions to the right, and then three to the left, the right side would be one and one-half heavier than the left." (That is, with a pointer above the beam, reverse if below).

On the page in question I have said: "When riders are not used the fractions of the unit may be estimated by the oscillations of the pointer. They will be of greater amplitude on one side of zero than on the other, and the middle point between any two consecutive extremes is very nearly that at which the pointer would come to rest if allowed to do so. More accurately, the middle point between the mean of two deviations on one side and the intervening deviation on the other side of zero, is that at which the points would rest. If, for example, the pointer swings five divisions to the right, then three to the left, and again four to the right, the mean between four and five is four and one-half, and the middle point between four and one-half to the right and three to the left is three-quarters to the right."

My friend, taking my mean of four and one-half as his initial swing to the right, makes the indicated deviation one and one-half, just double of what I have given, or would give as "nearly that at which the pointer would come to rest," if only one swing each way were noted, and if the first were four and one-half, the second three.

That my friend is wrong, notwithstanding his experiment—that is theoretically wrong—for the Lord only knows where any given balance may stop, will, I think, be conceded by any physicist, but as the error is a natural one, and is likely to be entertained by many, and as with any but a very fine balance the amount may be considerable in the case of an assay for gold, it may be well to discuss the subject a little. Let us get to the bottom of the matter. If the balance were absolutely perfect, that is if the parts were strictly rigid and hard, the knife edges true geometrical lines, and if it worked in vacuo without friction, it would swing forever if once put in motion; and it would swing either equally on each side of zero, or with unvarying preponderance on the one side, according as the loads on the pans were equal or not. In this case my friend's rule might be correct; I am not prepared to say positively, but I think it would. But no such conditions ever did or ever will exist. The beam is at last brought to rest by friction and the resistance of air, and the effect of them is a factor in the problem. The oscillations on either side will decrease constantly in extent, so that no two will be alike. Now let us apply my friend's rule. We have supposed 5 to the right, 3 left, 4 right. The secular decrement is here greater than would occur with a fine balance; we make it so purposely for the sake of clearness, the principle is the same. Let us take the first pair, 5 to 3; according to my friend the pointer should rest at 2 to the right. But take the second pair, 3 to 4; the pointer should rest at 1 to the right. Again take as my friend has done, the mean of the 5 and 4, which is 4½ as the one swing, and the one to the left, 3, as the other, and we get as the result 1½ to the right as the point of rest. These various results cannot all be correct.

Again, suppose the balance to be really in equilibrium, and the beam set in motion. It will not swing equally on both sides, but, as before, will gradually diminish its oscillations and finally stop. It will not stop exactly at zero, although the difference may not be perceived. The very fact that it is stopped by resistance to its motion carries with it the corollary that it stops a little short of zero; and if the balance were not in equilibrium, it would, for the same reason, stop a little short of the true point. It is for this reason, partly, that in the most accurate scientific work the weighings are finished by observation of the oscillations, and calculation therefrom. In order to eliminate errors of observation, a large number of swings are observed, and the mean result is taken.

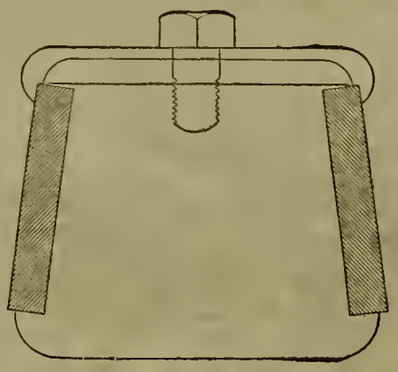


FIG. 3.—SECTION FULL SIZE.

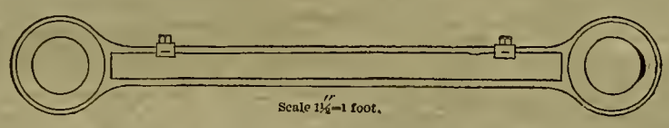


FIG. 4.—LONGITUDINAL ELEVATION OF SLIDING PAN.

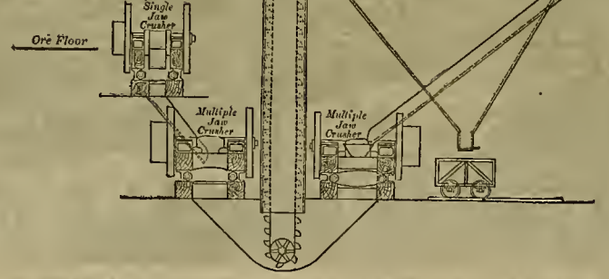


FIG. 5.—SKETCH ILLUSTRATING BLAKE SYSTEM OF FINE CRUSHING.

To return to our mutton: The balance is in equilibrium, the beam swinging. It will work something like this, admitting that matters are exaggerated for clearness, as before, and remembering that an odd number of oscillations must be taken on the one side, and an even included number on the other:

Left.	Right.
—	5
4.5	4
3.5	3
2.5	2
1.5	1
12.00	15

We have 4 left and 5 right swings, and the mean of each is 3, showing equilibrium. Now by our young friend's rule, either pair of oscillations would give ½ deviation, and that on either side, according to which pair he took!

The ratio of decrement would not be quite as given. As the oscillations decrease, the differences, though relatively greater, become smaller in actual amount, and this would cause an unappreciable error in the result, if all the observations were absolutely correct, which, however, cannot happen. By my friend's rule, the permanent deviation would constantly grow less, and might be on either side.

The Supreme Court Debris Decision.

The well-known case of the people *vs.* the Gold Run Mining Company, which was tried in 1881, before Judge Temple, was appealed, it will be remembered, from that gentleman's decision. The Judge in his decision said that the miners could work, provided that they impounded their heavier debris, the law gauge of that part of his decision being as follows: "Whenever it shall appear that efficient means have been provided to impound, detain and hold back such tailings at any point on said American river, above Alder creek, and that such means are sufficient to detain all boulders, cobble-stones, gravel and heavier sand, then said defendant shall be entitled to have said decree vacated and set aside."

From this decision, an appeal to the Supreme Court was made, the appeal being taken on an order denying a motion for a new trial, and from a judgment which perpetually restrains the company and compels the discontinuance of certain privileges as wrongful and injurious to public rights.

The Supreme Court, in a decision rendered this week, sustains the decision of Judge Temple. Justice McKee, in his opinion, says: "All of the questions involved in this case flow into one as the main question at issue, and that is, whether the defendant, as owner of its hydraulic mines, situated on the banks of the American river, which empties its waters into the Sacramento river—the principal navigable river within the State—has the right to dump its hydraulic debris into the river, to the endangerment of habitation and cultivation of large tracts of country and to the impairment of the navigation of the Sacramento river, and if there exists no such right in the defendant, do the acts committed constitute a public nuisance which may be enjoined in an action in the name of the people of the State?"

After having stated that the dumping of debris into the rivers is founded on popular customs, the Court says: "A legitimate private business, founded on a local custom, may grow into a force to threaten the safety of the people and destruction to public and private rights, and when it develops into that condition, the custom upon which it was founded becomes unreasonable because dangerous to public and private rights, and cannot be invoked to justify the continuance of the business in an unlawful manner. The rights of the people in the navigable rivers of the State are paramount and controlling. The State holds the absolute right to all navigable waters and the soils under them subject to any rights which may have been surrendered to the Federal Government. The soil she holds as trustee of a public trust for the benefit of the people. As to the claim of right derived from prescription and the statute of limitations, it is sufficient to say that a right to continue a public nuisance cannot be acquired by prescription, nor can it be legalized by lapse of time."

Justices McKinstry, Sharpstein and Ross concur in a long opinion with the decision of Justice McKee.

A counter appeal from the last clause of Judge Temple's decision has been reversed. Judge Temple, in his judgment, said that the defendant may apply to the Court to have the decree and restraining order modified, vacated or set aside.

Justice McKee, in his opinion, says that the perpetual injunction does not restrain the defendant from conducting its business in a lawful manner, and any means adopted to that end are lawful.

Justices Myrick, Morrison and Thornton concur in this decision, while Justices Sharpstein, Ross and McKinstry dissent.

The World's Fair.

Now that the election of 1884 has gone into history, and the results have been quite generally discussed, the people are ready for some other great event. This will be furnished in the opening of the World's Fair and Centennial Cotton Exposition, at New Orleans, on December 16th. Probably wider interest has been awakened in this great industrial event than there was in the Centennial of 1876. Certainly California has taken a greater share in the preparations, and many carloads of our products and manufactured goods are now on their way to the Crescent City to be duly displayed. Nor has California alone accepted the cordial invitation of Louisiana, but the general government and the other States and foreign countries have freely set apart money and material for the fair. We are assured that there is no doubt but that the display will be the most extensive and varied ever made in this country. As the fair will be of interest to many who have sent forward their products and to the many who will make a delightful winter excursion to the delta of the Mississippi, we have secured a bird's-eye view of the Exposition grounds, the adjacent portion of New Orleans, and the majestic river which flows quite near the grounds. We are sure the view will be of interest both to those who will attend and to those who will be obliged to trust to pictures alone for their sight of the Exposition. In our description we shall confine ourselves to a view of the salient points of the enterprise.

First, as to the site and the architectural features of the Exposition. The site is in the City Park, directly on the Mississippi river front. The main building is the largest ever constructed for such a purpose, being 1378 feet long by 905 wide, and having nearly twice the area of that at Philadelphia, in 1876, and will be larger than any building ever erected for exhibition purposes, even surpassing the famous Crystal Palace of London. The building for the United States Government and State exhibits is 885 feet by 565; the Horticultural Exhibition Building is 600 feet by 194, and there is an additional building for factories and mills, 350 feet long by 120 wide. In this latter all the processes of manufacture of cotton, the treatment of sugar cane and its products, and the harvesting and milling of rice will be shown. There is also an Art Building, 300 feet by 100, and a variety of smaller structures, the most notable of which is one for the special exhibition of Mexican products. With all the liberal provision made for exhibitors, it is found that there will not be room enough to accommodate all who have applied for space, unless some additional provision is made.

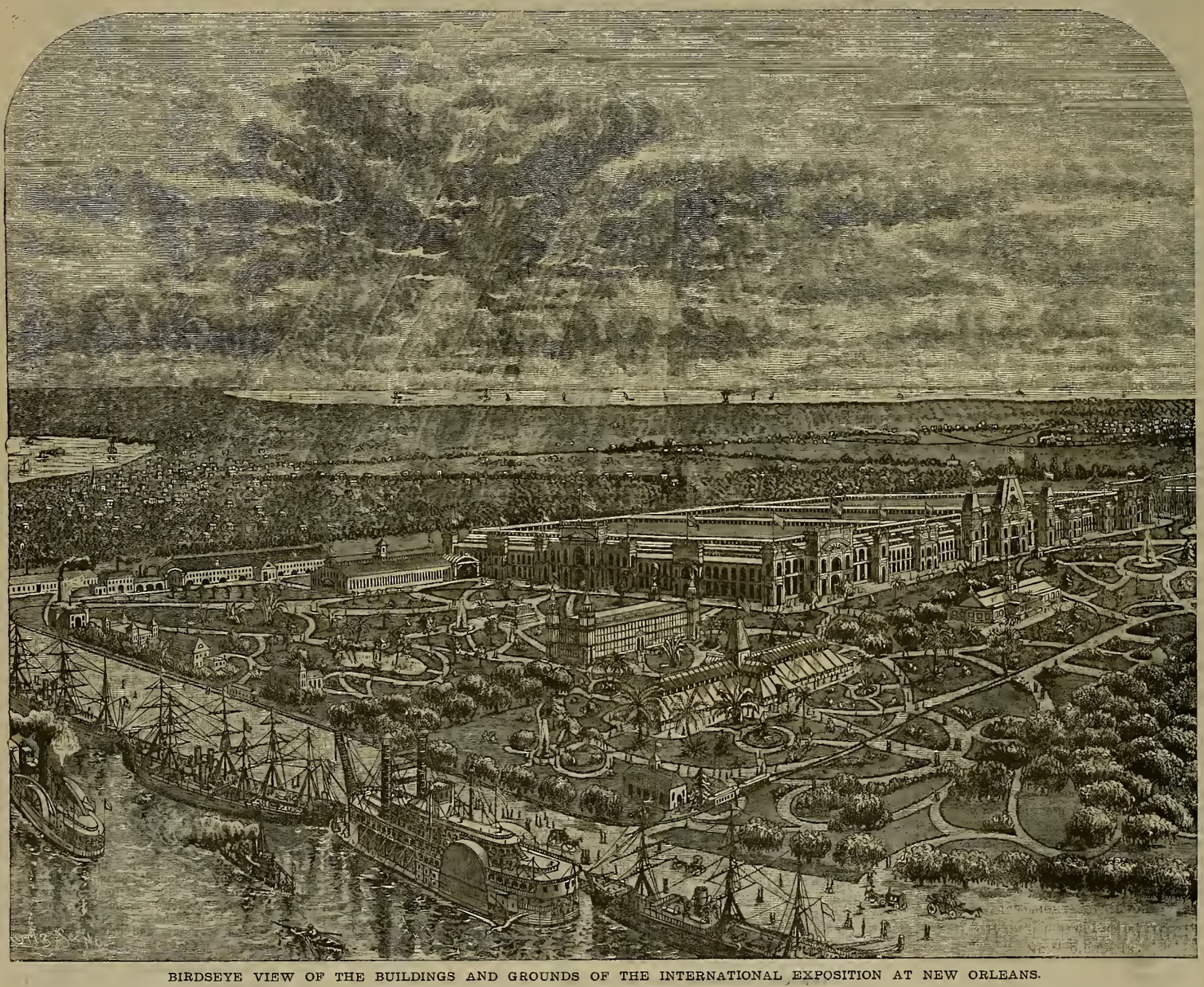
To give some idea how much more colossal the New Orleans Exposition will be than the Centennial at Philadelphia, it is sufficient to mention that while the latter required 2,200 horse-power to work the machinery, the exhibition at New Orleans will require 6,000 horse-power.

In the park are groves and walks lined with live oak trees of from 250 to 300 years' growth, enormous in size and covered with streamers of live oak moss, and making a dense shade. One of the trees in particular, is nearly six feet in diameter, spreading a shade of 150 feet. There are large numbers of lesser size on the grounds. There are lakes with islands, fountains, gardens, garden plats, and all the tropical plants in boundless luxuriance, eminently one of the grandest pictures the world has ever seen.

The idea of the New Orleans Exposition arose in this way. In 1784 the first cotton was shipped from the United States to Europe, and this Exposition had its origin in the idea of commemorating the event by a display of the cotton industries of the United States at the present time; but the idea met with such favor both from Congress and from the general public that it was decided to hold an international exposition of the world's industries. It is somewhat remarkable that this undertaking, beginning as a purely local movement for the exhibition of everything relating to cotton, should have grown thus to the dimensions of the greatest world's fair ever held. The first record of cotton as an industrial product of this country for export appears in the shipment of six bags, amounting to about one of the present bales, from Charleston to England in 1784. The present annual production is about 7,000,000 bales, and the value of the export leads that of all the products of our soil.

It was not until February, 1883, that the project took definite shape in an act of Congress providing for the necessary organization, and yet since that time the requisite funds have been raised and buildings constructed. A loan of a million dollars was voted by Congress, and $300,000 was appropriated for the government's share in the exhibition. The city of New Orleans appropriated $100,000, the State of Louisiana $100,000, and $500,000 was raised by private subscription. The various States and many cities and counties have made provision for contributing to the exhibition, and foreign countries have been quite liberal in taking part in the enterprise. Mexico heads the list with a grant of $200,000. It may be fairly expected that an exposition of the extent indicated above will contain exhibits of almost everything which the genius, ingenuity and labor of man can bring forth. It will undoubtedly be the grandest horticultural fair ever held, as we have described in former articles on this subject. In other agricultural branches it will also be notable, as the list of cash premiums in the several departments will show. The list embraces the following divisions and amount of prizes:

Fat stock	$10,000
Cattle	15,000
Horses and mules	15,000
Hogs	7,000
Sheep	7,000
Dairy products	10,000
Farm and garden products	20,000
Humane inventions	10,000
Poultry and pet stock	5,000
Bench show	5,000



BIRDSEYE VIEW OF THE BUILDINGS AND GROUNDS OF THE INTERNATIONAL EXPOSITION AT NEW ORLEANS.

The exhibition of fat stock will take place between December 16th and January 10th; poultry and pet stock, between January 15th and February 15th; sheep and goats, and bench show, between January 25th and February 25th; horses and mules, between February 15th and March 15th; cattle, between March 15th and April 15th; and swine, between April 15th and May 15th.

As for the entertainment of visitors, we are assured that the managers of the Exposition have made such admirable arrangements in the interests of the expected guests, that there is no longer a doubt as to providing for all who come. Furthermore, those arrangements contemplate the absolute protection against unfairness and extortion of all who avail themselves of the Exposition Bureau of Information and Accommodation. At that Bureau, the visitor will find a complete table of all the places in the city where board or lodging, or both, may be had.

PRECIOUS METALS IN ARTS.—One of the most difficult facts to ascertain in connection with the supplies of gold and silver is the amount consumed in the arts. The amount that goes to the Mints for coinage, or that goes out of the country in the form of bars, can be told to the fractional part of an ounce. But the amounts used up in manufactures have never been definitely reached. In former years some wild guesses have been made to cover this leak. The present Director of the Mint has been in the habit of seeking information on this head direct from the manufacturers. During the past year 7,969 letters were sent to all persons known to be engaged in the manufacture of gold and silver ware. To these letters there were 5,418 responses, showing that 2,734 persons or firms engaged in the manufacture or repair of articles of ornamentation and use had consumed during the year nearly $14,500,000 in gold and over $5,500,000 in silver, or a total of over $20,000,000. This is $7,000,000 more than for the previous year of 1882, but the number of persons reporting in 1883 was more than double of those of 1882. The figures of the United States Assay Office in New York also indicate the same thing, thus confirming a consumption of about $20,000,000 in arts in 1883.

COPPER MANUFACTURERS WAKING UP.—The agitation of copper in connection with roofing, etc., is stirring up the manufacturers. A circular letter issued by one of the large copper rolling mills of the country, says: We would respectfully invite your attention to the use of sheet copper for roofing, valleys and conductors. The low price of copper at present, with the consideration of its great durability, is a strong inducement for the general use of this valuable article for such service. There was a time when, even at a much higher price, copper was largely used, with entire satisfaction; but of late the introduction of cheaper articles interfered with its general adoption. Now, however, we offer it at such a low price, that all who wish an article so well adapted in every way for the purpose, should use it. Examples of the durability and perfect adaption of copper for exposed work, can be seen on numerous public buildings (Washington, Rock Island, Nashville and U. S. custom-houses and post-offices,) extending back many years.

PINE ROCK.—Judge Peel has on exhibition at his office, some specimens of galena silver ore and coal that will compare with any rock that has yet been displayed in this city coming from the wide extent of mineral producing territory in this immediate vicinity. These specimens are the product of the Pend d'Oreille claims, and it is evident from their richness and the extent of the ledges from which the specimens were taken, that that section will soon become as important a mining region as any in the country. The place from which the ore was taken, is on the Clarke's Fork, and is a portion of the great mineral belt that extends through Idaho up into the Cootenai country and further north in British Columbia. Quite a number of persons have taken up claims in that locality, and the country will be one enormous mining camp in a very few years.—*Spokane Review.*

YELLOW OCHRE.—Henry Hutchins was in our office last week with specimens of yellow ochre from his mine in Campo Seco district, near Burson. The ochre taken from it is superior to any yet found in the State, and probably equal to any in the country. About 60 tons are now on the dump, and the supply is practically inexhaustible. It has received the endorsement of State Mineralogist Hanks, and we hope it may prove a "big thing."—*Valley Review* (Lodi).

THE 100 ton locomotive engine for use in Tehachapi Pass has been shipped to its field of operation. It is named after ex-Governor Stanford, and is known as "El Gobernador." It is the largest engine in the world, and when stripped of all movable parts for shipment weighed sixty-three tons. There are two brakes for each of the ten driving wheels, and the task of getting these in place so they would operate harmoniously was quite a difficult one.

MR. HERMAN GREENMAN, of Oakland, who died in that city this week, was well known to the mining community in connection with the quicksilver mining industry on this coast. Though of a modest and retiring disposition, he made his mark in the branch with which he was connected. His associates speak of him as a man of sterling worth, kind hearted and true.

QUICKSILVER is unusually quiet and depressed. Many of the mines are either shut down or are working small forces. Exports from this port in October were 457 flasks, valued at $13,841, and those by water since January 1st were 11,818 flasks, valued at $339,721. This is the smallest showing for years. A cable dispatch from Loudon says that a syndicate there has bought up large quantities, and that the price has advanced.

GEOLOGISTS AT WORK.—The Reno *Journal* says: A party of United States Geological Surveyors are camped at Steamboat Springs under instruction to make a systematic survey of a section of country 12 miles square at and around Steamboat. There are five persons in the party, and they expect that it will require several months to complete the work.

USEFUL INFORMATION.

Cast Iron Cutlery.

This title may appear anomalous, but cast iron cutlery of certain forms is far more common than its purchasers generally imagine. And it is not necessarily of a poor quality, although made of nothing but cast iron. In the writer's family is a pair of scissors of cast iron that has been used for three years, and has been several times sharpened. The writer has shaved with a cast iron razor, which did excellent work for months. There are in Connecticut two quite extensive establishments which reckon cast iron cutlery as among the important products of their work.

This allusion to cast iron shears and scissors does not refer to the combined cast iron and steel articles which are usually considered superior to the forged ones. These have a steel inner plate cemented on each blade by the fused iron when it is poured into the mould; but the cast iron shears and scissors are wholly and entirely of cast iron, and they are finished for the market precisely as they come from the mould.

The quality of the iron used is the same or similar to that used in casting for malleable iron, and for cutlery it is cast in chills. When broken, the crystallization is very similar to that of hardened cast steel, and, except for lack of elasticity, it serves the same general purposes. But although this cast iron is not adapted to tools which work by blows, it is sometimes made into ice picks and axes, hatchets and steak choppers. The manufacturers of cast iron shears and scissors make no secret of the material, and sell their goods for just what they are. Of course they are sold cheaper than forged work of steel can be sold. Retailers, also, know that this cheap cutlery is not steel, and usually—unless dishonest—they will answer truthfully questions on the subject. But, really, a pair of cast iron shears or scissors for ordinary household work is just as good as one of forged cast steel. There is only one difficulty in the way of superseding cast steel forgings by cast iron castings in these implements, which is that the chill that makes the iron hard does not always extend to a depth that will allow of repeated grindings and re-sharpenings, the material crumbling before it can be brought to an edge. But when first ground and edged, the shears are as keen as those of tempered cast steel, and the blades retain their edges longer.—*Scientific American.*

Test for Acid Oil.

On a sheet of bright copper make a number of indentations with a round-faced hammer or punch. Place samples of oil within the indentations and allow them to remain there a few days. If there is any acid in the oil verdigris will appear. The presence of a blue tinge in a glass vial of oil is frequently assumed to indicate the presence of mineral oil. This, however, is illusory, as the same effect is frequently observed in the finest and best vegetable oils.

Of course many good oils are adulterated, and the entire oil trade has become odious for this reason. Prof. Friese said that a large amount of what purported to be pure linseed oil placed on sale was examined by him and found to contain resin, sulphureted oil and fish oil.

The use of refined paraffin oil for machinery is on the increase, and the growing demand for lubricants in which it is the chief ingredient is steady, and an immense trade is the result. However much it may be depreciated as inferior for certain purposes to whale oil, the advances in its treatment, and the increasing knowledge of its capacity to unite with other substances, have made it an indispensable article of general use. Its discovery came in good time, for, without it, the manufacturer would have been in as great need of a cheap and efficacious lubricant for his machinery as the world would have been in want of an inexpensive and satisfactory light without the accompanying kerosene.—*Oil and Drug Reporter.*

SAND, BRICKS AND STONES.—M. Hignette, in the *Bulletin-technologique*, describes a new ceramic product from the waste sands of glass factories, which often accumulate in immense quantities so as to occasion great embarrassment. The sand is subjected to an immense hydraulic pressure, and then baked in furnaces at a high temperature, so as to produce blocks of various forms and dimensions, of a uniform white color, which are composed of almost pure silex. The crushing load is from 370 to 450 kilometers per square centimeter. The bricks when plunged in chlorhydric and sulphuric acids, show no trace of alteration. The product has remarkable solidity and tenacity; it is not affected by the heaviest frosts or by the action of sun or rain; it resists very high temperatures, provided no flux is present; it is very light, its specific gravity being only 1·5; it is of a fine white color, which will make it sought for many architectural effects in combination with bricks or stones of other colors.—*Chron. Industr.*

THE WICKED MOSQUITO.—A writer in the London *Sportsman* thus describes a mosquito as seen under a microscope: It appears that in the "bill" of the little beast alone, there are no fewer than five distinct surgical instruments. These are described as a lance, two neat saws, a suction pump, and a small Corliss engine. It appears that when a "skeeter" settles down to his work upon a nice tender portion of the human frame, the lance is first pushed into the flesh, then the two saws, placed back to back, begin to work up and down to enlarge the hole, then the pump is inserted, and the victim's blood is siphoned up to reservoirs carried behind, and finally, to complete the cruelty of the performance, the wretch drops a quantity of poison into the wound to keep it irritated. Then the diminutive fiend takes a fly around just to digest your gore, and makes tracks for a fresh victim, or, if the first has been of unusual good quality he returns to the same happy hunting ground. The mosquito's marvelous energy, combined with his portable operating chest, makes him at once a terror and a pest.

BUFFALO HORN FURNITURE.—The *Tradesman* of Chattanooga, says: "The manufacture of 'buffalo horn' furniture has become an industry in New York. The horns are not those of the bison, as is commonly believed, but are from the cattle killed in the abattoirs. They are sold at the slaughter-houses for a little more than what the button manufacturers give, are cleansed, dried, scraped and polished. The cost of making the horns good is less than that of carved wood, but they bring two and three times more than the latter. The new industry is almost monopolized by Germans from Saxony."

POISONOUS STOCKINGS.—The poisonous properties of stockings, dyed with the brilliant aniline dyes, are rendered harmless by dipping the articles in a bath of rubber dissolved in naphtha, or some other re-agent. Subsequent evaporation covers each fiber with a thin film of rubber, and so prevents the transfer of the coloring material from the goods to the skin.

FANCY ARTICLES OF CORK.—A German inventor has utilized cork in the manufacture of fancy articles by a novel process. Powdered cork is mixed with starch and water, and the mass kneaded while boiling hot until thoroughly mixed. It is then poured into molds, and afterwards dried at a very high temperature.

CEMENTING LABELS ON IRON.—A good cement for putting tickets on iron-work and tin is thus made: Take rye meal, a little solution of glue and water, and make a paste, but not too thick; mix it with as much Venetian turpentine as necessary. It will stand water.

SALT AND LIME.—The addition of salt to lime while slaking, which is then properly thinned with skim-milk from which all the cream has been taken, makes, it is said, a permanent whitewash for outdoor work, and renders the wood incombustible. It is an excellent wash for preserving wood and for all farm purposes.

ARTIFICIAL MARBLE can be made by soaking plaster of Paris in a solution of alum; bake it in an oven, and then grind it to a powder. In using, mix it with water, and to produce the clouds and veins stir in any dry color you wish. This will become very hard and susceptible of a high polish.

GOOD HEALTH.

Treatment of Hemorrhages from the Lungs.

Rest in bed, with the head and shoulders elevated. Mental and physical quiet. Restrain cough as much as possible, as it greatly aggravates the hemorrhage. Give the patient iced water to drink, and bits of ice to swallow. Apply ice compresses over chest, and every fifteen minutes make hot application between the shoulders by means of hot bricks, fomentations, or hot bags. Take care to keep the trunk and limbs dry, and apply heat to the extremities. Frozen compresses may be applied thus: Mix, in an ordinary large milk-pan, equal parts of pounded ice and salt, at least two inches deep. Mix quickly and cover. Place the pan upon a compress of cotton or linen of four or five thicknesses wrung out of iced water as dry as possible. In a few seconds the compress will be frozen. Apply at once, and cover with a dry flannel. A good means of applying continuous cold, is by means of the syphon syringe, as shown in the figure. The upper vessel is filled with water containing two or three pounds of salt to the gallon, and a quantity of ice. The current of the ice-cold mixture is started by means of the tabs on the sides of the bag, the stop-cock on the lower tube being closed. When the bag is full enough, the stop-cock is opened sufficiently to allow the fluid in the bag to pass out at the same rate that it runs in. When the water has nearly run out of the upper vessel, that which has run into the lower vessel should be put into the upper one, and a new supply of ice, or ice and salt, added. By this means an intense degree of cold may be kept up for hours, without wetting the patient or giving him any inconvenience whatever. Good results are also obtained by employing cold enemas. The temperature should be as low as the patient will bear. It is customary to add a little vinegar to the rectal injections, though we think the addition is unnecessary. Common salt is a remedy popularly reputed to be of value in these cases. The usual dose, is a teaspoonful of finely powdered salt taken dry. The most useful internal remedy, however, is the inhalation of a solution of alum and tannin. The proportions should be five to ten grains to the ounce of water, and the solution should be inhaled by the use of an atomizer.

The vapor of turpentine may be inhaled by means of an inhaling bottle, which can be easily made by the aid of a large-mouthed bottle and a couple of glass tubes, or obtained from any druggist; or the turpentine may be placed in a tea-cup, set in a basin of warm water, and the whole covered with a cone of stiff paper, made with an opening at the top, which should be placed to the nose and mouth, so that the vapor given out by the turpentine may be inhaled. —*Good Health.*

A New Anæsthetic.

A new, and what promises to be a most important discovery to the medical profession, was recently made through pure accident by a German student, at Heidelberg, who had occasion to experiment with hydrochlorate of cocoaine. Getting some by accident in his eye, he was amazed to find that it caused the surface to become insensible to all feeling. A few days since, this anæsthetic was tried by a prominent occulist of this city, who had occasion to perform an operation for the removal of a cataract from a woman's eye, and with the greatest success.

Her eyelids were held wide open, and four drops of the liquid were cautiously dropped upon the surface of the eyes. It produced a slight anæsthetic effect upon the external coating. After an interval of five minutes, four drops more were applied, which caused the insensible condition to extend deeper, and after waiting another five minutes four drops more were used. After the last application had done its work, the sensation of the eyes was tested, and they were found to be so entirely anæsthetized that the very severe and otherwise painful operation was performed without the slightest pain to the patient. Hydrochlorate of cocoaine is the active principle of cocoa, and cannot be had in this country as yet.

Dr. Noyes, of New York, who was in Heidelberg at the time, heard of the wonderful discovery, and sent a brief account of it and its operation to his friends in the medical profession in that city. This anæsthetic has already been used in a few cases by one or two eminent oculists in New York. The material is costly at present, and as it has not been made in this country, it will be some time before it will be cheap enough to be used in ordinary practice.

Powerful as is the effect of this anæsthetic on the eye, it does not harm the skin in the least, its action being confined to the end bulbes of the nerves in the eye. The effect in the healthy eye lasts from 9 to 50 minutes, and has not the slightest effect upon the eyes.

An anæsthetic that would render a particular part of the human body without sensation, and avoid the necessity of using chloroform or ether, has long been sought, and this new discovery will be thoroughly tested and experimented with, in the hope that it may be found to have an effect upon other portions of the body than the eye. Since the above was in type, we notice that this new local anæsthetic has been used with success in New York upon other parts of the body—as in opening felons, for sensitive sore throat, etc.

ANTICIPATING CHOLERA.—Dr. Durgin, chairman of the Boston City Board of Health, has returned from the meeting of the American Public Health Association at St. Louis, of the Advisory Council, of which he is a member. He says the work accomplished at the meeting reaches every man in the country who takes an interest in sanitary measures, and he expects a large amount of good to result from it. He found that there is a universal feeling along the Eastern seaboard that Asiatic cholera will undoubtedly reach this country next year. The leading sanitarians whom he met thought it inevitable, and the most important subject that could therefore be considered was cholera and how to meet and defeat it.

TEA IN FATIGUE.—Mr. W. Mattieu Williams calls attention to the danger attending the habitual use of a cup of tea when fatigued from brain work, thus enabling a man to continue at work. In reply to an assertion that "fatigue disappears like magic after drinking a cup of tea," he says "that which actually disappears is the sensation of fatigue, which may be deadened by any one of a multitude of other drugs besides the alkaloid of tea." He adds: "This sense of fatigue is the natural safety-valve of the whole vital machinery, especially of its prime mover the brain."

OIL OF WINTERGREEN, mixed with an equal quantity of olive oil, when applied externally to inflamed joints affected by acute rheumatism, is maintained to be, on high therapeutic authority, a means of instant relief from pain. At any rate, its introduction to the sick chamber is unobjectionable, if only for the agreeable odor it imparts to the atmosphere.

LEMONADE FOR DIARRHŒA.—Dr. Vigouroux recommends a glass of hot lemonade, every half hour or less as indicated, in diarrhœa. It certainly is pleasant, and is stated to be effectual. —*Med. Bulletin.*

OHIO statistics show that each year one brakeman in eight suffer injury or death while coupling or uncoupling freight cars.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SOUTH SPRING HILL.—Amador *Ledger*, Nov. 21: Improvements are being made at a lively rate around this mine, indicating that the owners are resolved to work it on a scale in keeping with its prospect for a permanent paying mine. The new track from the mine to the mill is completed, and in running order. The iron car, run easily by one horse, delivers three tons of ore a trip. A force of men is now busy putting up new hoisting works. The new engine is on the ground, also 2,000 feet of new flat wire rope, and the new hoisting machinery is expected to be in running order in the course of two or three weeks. A new dump is also being constructed, capable of holding 400 tons of rock. The last clean-up at the mill was made on the 2d of November, and paid about as usual, the total yield being $4,000. The mine has already surrendered upwards of $40,000, and the mill has only been kept running part of the time. George F. Morse, the superintendent of the company, has been in the county for several weeks, looking after the interests of the company, and we understand is well satisfied with the outlook of the mine, and the way in which it has been managed.

EL DORADO.—This quartz claim is located east of the Keystone, and is owned by Dr. T. H. Mayon and others. A shaft has been sunk to the depth of 270 feet. Recently a tunnel was started from the shaft at a depth of 100 feet from the surface, and running in a northerly direction. Two shifts, of 10 hours each, were employed on this drift, and after reaching 30 feet from the shaft, a fine body of quartz was struck last week. The ledge shows six feet in width, the rock being of that dark-streaked character met with in the Keystone and adjacent mines. It shows considerable sulphurets, and prospects well. The indications favor the development of another paying mine here. The hoisting of ore was to be inaugurated last Wednesday.

MISCELLANEOUS.—The Lighthouse mine resumed operations on Monday of last week. J. Hagerman and C. Hall are taking out ore from the tunnel, preparatory to starting up the mill. A Stockton company has taken a contract to sink 100 feet on the Laplata mine, between Ione and Forest Home. They are getting everything in readiness before the rain sets in. They prospected several tons of the surface rock in their two-stamp mill this fall. It is said to have yielded well, considering it was suface ore. The Volcano Gold Gravel M. Co. have a large number of men at work putting the flume in order for the winter's work. They are putting in new blocks in the boxes, which is a big job, owing to the length of the flume. The Seaton mine, near Drytown, was closed down last Saturday. The pumping machinery was inadequate to the requirements, and the prospects would not justify the expense of putting in new machinery, so word was sent up to quit work. Hoisting works are being erected at the new coal mine, near Dosh's store, in Ione Valley.

SUTTER CREEK.—Cor. Amador *Sentinel*, Nov. 21: The Mahoney mill will be started up shortly on rock from Cal. Hammack's claim, between Sutter and Amador. Three or four teams are now hauling. The Sutter Creek foundry has been somewhat rushed of late in putting up new hoisting works for the Plymouth Consolidated Mining Company, to be run by one of Donnelly's patent water wheels. The Medean mine, back of Amador city, has resumed operations after an idleness of a year. The company has put up a new hoisting works and a patent whini. They are now sinking with very good indications.

Inyo.

BULLION SHIPMENTS.—Inyo *Independent*, Nov. 21: J. Eddy made a shipment of 150 lbs. bullion last week, from the Snow's Canyon mill. The bullion was gold and silver. Another bar of about equal weight is now ready for shipment.

Mono.

BODIE MILL ROBBED.—Bodie *Free Press*, Nov. 21: Last evening at an early hour a street rumor became general and the usual exaggerations and surmises followed the report that gold dust and selected rich rock to the value of $13,000 had been abstracted from the Bodie mill. It was the property of the Bodie Con., and many were the speculations as to how any one but the employees could possibly avail themselves of any such opportunity. This morning the story was not generally credited, but upon interviewing Captain Kelley, the superintendent, it was found to be true; that gold to the value of about $12,000 had been ingeniously spirited away; that after careful assays had been made by Johnny Irwin a very close approximation as to its value was arrived at. Suspicion pointed to two of the employees, but upon a careful investigation by the superintendent, assayer Irwin and Willis, the millman, no grounds nor the slightest evidence could be traced to such a source. Concerning how it could be done and who the perpetrators were most likely to be, will be kept from the public for a reasonable time, while further developments are anxiously looked for.

STANDARD TAILINGS.—Bodie *Free Press*, Nov. 19: The excavation of tailings and the hauling thereof from the big reservoir near the Standard mill has been steadily prosecuted for the past summer and fall. The results are shown in the regular bullion shipments, and have added materially to the average output. But now that the supply is nearly exhausted, it is hard to imagine what effect it will have on the future operations of the Standard Company. It is hoped they will conclude to manufacture more tailings, go down the canyon and retail that which has been tailed, or, in fact, do anything to preserve the reputation of the once boss property.

Nevada.

TAKING OUT A CRUSHING.—Nevada *Transcript*, Nov. 21: J. J. Rogers is taking out a crushing of ore from a ledge that runs through J. J. Meacham's lot on Piety Hill. Some quartz has been found there formerly, but a difficulty is going any depth on it with out machinery has been experienced in the shape of a heavy flow of water. Mr. Roger will expect the ledge as thoroughly as possible, and if he can show the signs of a permanent and rich chute of ore, there ought to be no difficulty in finding some one with capital to go ahead and develop the property in a proper manner.

THE KINGSBURY MINE.—John Coe has put an overshot wheel and a five-inch Cornish pump on the Kingsbury mine, on Little Deer creek, and is now engaged in sinking preparatory to drifting for the pay chute, which, above water level, yielded some very good ore. Mr. Coe is now down about 18 feet, and will probably begin drifting at a depth of 50 or 60 feet.

THE CHARONNAT MINE.—The Charonnat mine has been steadily improving for some time past. In the bottom of the shaft is a twenty-inch ledge, the ore from which is estimated to be worth from $150 to $200 a ton. A station is now being made at that point, and drifts will be run. The 800 and 1,000 levels are showing excellent ore.

TWO OLD MINES.—*Transcript*, Nov. 21: Arrangements have been made to resume the development of the old California mine, near the Baltic, and of the Salina mine, on Gaston Ridge. Two gentlemen from below passed through here on their way to Eureka township where these claims are situated, saying that they proposed to put a force of prospectors at work immediately, and that it was their expectation to erect the necessary machinery in the spring. The quartz belt extending from the Yuba mine to Graniteville, a distanee of from six to seven miles, has come into considerable prominence during the past two years, and bids fair to take a place among the best mining districts in the county. The ledges found there are as a rule of low grade, but they are so large and the facilities for working them so advantageous that with good management most of the deposits can be extracted and milled at a profit. Some of the mines up there are already paying good profits, notably the Yuba and Eagle Bird.

THE TRUCKEE MINE.—Truckee *Republican*, Nov. 21: Superintendent C. F. Byrne has just returned from the Truckee Mining Company's tunnel at Mohawk. The tunnel is now in 850 ft, and 1,112 ft of new track has been laid. Through the efficient management of superintendent Byrne, work has been pressed forward until everything is in complete readiness for the company to commence mining as soon as spring opens. The timbers in the tunnel have been carefully examined and strengthened, and nothing is now lacking except the water which will come with the melting snows of springtime. The tunnel reaches the gravel deposit of the old river channel inside of the rimrock, and in what appears to be an eddy of the main channel. The prospect is exceedingly encouraging, the gold being coarse, and apparently in large quantities. The members of this company are all eitizens of Truckee, and the patience and pertinacity with which they have kept at work, deserves the rich reward which doubtless awaits them. Now that drifting can be commenced in earnest, it is believed that the mine will pay regular dividends from the time labor begins in the spring.

MINING REPORT.—*Foothill Tidings*, Nov. 21: A trip around to the different mines will convince anyone that business in that line is unusually aetive, and mining men are more hopeful now than we have seen them for a long time. There are but few idle men in town and all of the old mines are running with a full force. A business man of experience, and one who is a close observer, said to our reporter yesterday: "The outlook for Grass Valley now is better than it has been for the past 15 years, and by the early part of next spring everything in the mining line will be booming." Certainly the present aspect of our mines amply justifies the remark, for the old mines are looking better, as a rule, than they have ever looked, and the new prospects are numerous and promise well. Every custom mill in this district has all the crushing it can do and there are several more of those mills now than there were a year ago. Teams are busy hauling quartz from every direction, and altogether our people have ample cause for rejoicing. The Idaho is looking well in its lower levels, and the company is now running for the 1600-ft level. The mine pays a regular monthly dividend, and it is probable that the dividend declared next month will make a net amount of $100 per share upon the capital stock paid in dividends during the past year. The old mine has a long and substantial future before it. The Empire, the oldest mine in the district, is now working more men than it has ever worked before; has a new mill with all the latest improvements, and the company are now having surveys made for the purpose of bringing in water with which to run their machinery. The last venture will cost something over $50,000. The Empire is keeping up with the times, is constantly making improvements in its mode and manner of work, and is looking better to-day than it has at any time during its eventful career. The New York Hill, another one of the old mines, has improved greatly since our last report, and the body of ore, found in the south drift, paid $160 per load for crushing. The company are now running the drift north from the 1300 level, and are prospecting in other parts of the mine. Several of the tributers at work in the New York Hill are now having their ore crushed, and a large yield is expected. The work of erecting the machinery on the North Star ground is now nearly finished. One of the pumps is already at work, and the water has been lowered 30 ft below the drain tunnel. The company have nearly all their wood and material in, and are in fine shape for completely opening up the mine. The Peabody is still looking well, and yesterday a meeting was held and the number of shares was increased from 3,000 to 30,000. The company did not pay a dividend this month, for the reason that they have in contemplation new works, of exactly what nature will not be determined until the 20th of December. The ledge is still very rich and is increasing in size. The Imperial mine, on Deer creek, is still drifting east and west from the 280-ft level. Each drift is in 180 ft from the shaft, and the company confidently expect to get into the pay chute at any hour. Work in the Imperial is being pushed as rapidly as possible night and day, and the rock looks first rate. The Hartery for the past two months has been sending up the very richest kind of specimen ore, but none of it has been better than that brought up on Tuesday, and is now at Loutzenheiser's store. Work is constantly going on in the Hartery, and the owners say that it will be in full blast by spring. The Horse Shoe, which is pretty certain to be an extension of the old Allison Ranch, is constantly improving as the shaft is being put down. Much of the rock taken from the ledge shows free gold, and all of it is said by miners to be first-class milling ore. The ledge at the bottom of the shaft is over a foot in width, and the sbaft is now down 185 ft. Mining men who have run the Horse Shoe have great faith in it. The Slate Ledge mine (the Perrin), owned by Joseph Perrin and G. S. Brown, has been leased for some time by Mansau, Cryer & Co. The lessees pay the owners 20 per cent of the gross proceeds of the mine. The company are now drifting from the 200-ft level, and will start a new level in a day or two. The ledge in the drift averages about 12 inches in thickness, and it is all good-milling ore, keeping Ferrin's 10-stamp mill almost constantly occupied in crushing the ore. About 21 men are kept at work in and about the mine, and from present appearances the mine will prove a continual dividend payer. George Mainbart & Co. have leased the Pennsylvania mine, and are taking out some good ore. The company have their air shaft down and quartz now coming from the drift shows free gold and sulphurets. Mr. Mainhart says he has no doubt but that the ore now coming from the Pennsylvania will be profitable for milling. The shaft on the Mascotte is still being put down, and the quartz has considerably improved of late. This mine is owned principally by the Robinson brothers, of Robinson's circus, and they intend to thoroughly prospect it. The Crown Point Company are working away on their mine in the eastern part of town, and have good prospects before them. Rock is being taken out of the old Merrimack mine, and is being crushed at Rogers' mill. About 14 loads of Merrimack ore is now on the dump at the mill and it looks well. The crushing will be completed in a few days. There is now considerable talk about resuming work on the old Allison Ranch mine. Everybody who knows anything about the Allison Ranch says that the day it closed down, it was one of the richest mines on the Pacific Coast.

Plumas.

OPHIR CON.—Greenville *Bulletin*, Nov. 21: From Mr. Hall we learn that the drift which was being driven along the hanging wall of the ledge in the No. 3 tunnel, has reached quartz. The ledge has widened at least three ft in the last ten days' run. A shaft has been sunk in the mouth of the tunnel, on the ledge, and the vein widens about one ft in five as the shaft descends. Mr. Hall says he is well pleased with the prospect.

THE CRESCENT.—It is unfortunate for the mine and the community that this property is still involved in legal difficulties. It is believed that these difficulties are the only ones which prevent the operation of the mine. It is, no doubt, a valuable property, and would pay well if wisely and economically handled. Mr. Cornell, who has charge of it, is having repairs made under ground. Weak timbers are being replaced by new ones in the different tunnels to prevent caving.

San Bernardino.

GOLD.—San Bernardino *Index*, Nov. 22: A rich gold-bearing ledge has been struck on the desert, about five miles south of Kramer, a station on the A. & P., between Waterman and Mojave. Samples assay $70.23 per ton. The ledge is three ft wide and contains two ft of solid quartz. A silver ledge was found about six miles south of the gold find, but the assay is only $5.50 per ton.

Siskiyou.

NEW LEDGE.—Yreka *Union*, Nov. 21: From Mr. Donaldson I learn that a gold-bearing ledge has been discovered at the head of Methodist creek, a small stream emptying into the south fork of Salmon at Yocumville.

Sierra.

A PROMISING FIELD.—One of the most promising fields for prospecting, with the almost absolute certainty of adequate remuneration, is in the ground owned by the South Fork Company, at Forest City. Some years ago the company drove a tunnel between 2,000 ft and 3,000 ft east and into the ridge between Forest City and Alleghany. Finding a channel, a shaft was sunk 44 ft and a good prospect obtained. The fact that the tunnel was so much too high, and the large amount of water encountered, made it impossible for the company to develop the property at that time. The discoveries since made by the Extension Company have rendered it almost certain that the deposits then found was a well defined channel, and probably none other than the old Rock Creek channel which the Ruby Company is now working, and which the Extension tunnel has just crossed. So far as is now known, this channel must pass into and down this ridge, past the point where the shaft was sunk. We learn that it is in contemplation to start a new tunnel below Forest City, in Oregon creek, at a depth sufficient to bottom the channel at the point above mentioned, with the chances favorable for finding pay long before that point is reached, by running more to the south further under the ridge than the old tunnel. No systematic and thorough exploration of this ridge, for any distance east of Forest City, has ever yet been made, and there seems, in the light of latter developments, every reason to anticipate a large and rich channel in that part of the South Fork's property.

FOREST CITY.—Sierra *Tribune*, Nov. 21: Recently a raise was made from the main tunnel of the Mammoth Spring mine and gravel encountered that prospects well. The claim adjoins the Bald Mountain Extension and South Fork mining ground. Good prospects have been encountered under the lava flow that crosses the channel in the Bald Mountain mine. The dirt is reported to yield $7 per carload. The gravel is about 20 ft below the main tunnel and therefore the new ground will be worked through an incline. Supt. Wallis is still running ahead the tunnel in the South Fork ground. It is now in lava similar to that encountered in the Extension tunnel some time ago. Henry Redmond and Noah Cadman have purchased an interest in a gravel mine at American Hill and are preparing to open it up. They are very much pleased with the purchase and hope to receive profitable returns from it.

Shasta.

LIVELIER TIMES.—Shasta *Courier*, Nov. 21: Shasta has been visited with a large number of mining speculators, prospectors, capitalists, etc., this week, all of whom seem to have the strongest faith in our mines. Prospects are very favorable for livelier times in Shasta county.

SMITH FORK.—Mining matters are rather quiet at present, the following being about all there is to report: O. Engle is getting the Chicago mill ready to start on chloride silver ore from the Centennial mine of C. J. Rossel. A few tons from the Chicago will also be tried, and if satisfactory, more will be taken out and worked. Robinson & Cooper are sinking a sbaft on the Bullion, and taking out some good silver ore. J. B. Strong is taking out some good ore at the Atlantic. Hubbard and partner are running some ore from their ledge, and intend to work next on the Pacific. Some work is being done and ore taken out on the South Chicago. A couple of quartz sharps from below are here, "viewing the landscape o'er.t' The Hardscrabble folks are getting ready for their winter's worg.

Tuolumne.

SOULSBYVILLE.—Tuolumne *Independent*: The Pennsylvania mine at Soulsbyville shut down last week, and will remain so for a short time. The quartz ledge having been cut off by a slide in the bottom, they have been drifting several ft, but at last report I was informed that they had not found it. Most all the leads in this district bave been cut off by slides, and by drifting on them they are liable to be better than ever when found again, or perhaps not so good! The Dead Horse mine has started up again, the crack in the boiler having been repaired by a boiler maker from San Francisco.

Trinity.

NEW RIVER MINES.—Trinity *Journal*, Nov. 22: We have had the pleasure of meeting Mr. George Dean, recently of Eureka, but now located at the New River quartz mines where he will winter in company with Maj. Frank Duff. Mr. Dean arrived in town Thursday evening coming by way of Rattlesnake. He says there can be no question but that the mines are much more accessible from Weaverville than by any other route; that during the long days of summer the trip to Eureka cannot be made in less than three days hard riding, and at this season of the year four days barely suffice. As to the mining prospects, he says they are the best that ever were. The Mary Blane, Ridgeway, Hard-Tack, Yankee Boy and a few other locations are on well-defined ledges and prospect high into the hundreds, some going well into the thousands. As an instance of how high some of the rock goes, he mentioned crushing 14 ounces which yielded $24; this, of course, was not a fair sample. Many locations have been made on good prospects, but are not yet sufficiently developed to know their real worth. He says there were about 300 men in at the mines this summer, nearly 150 there now, and that from 50 to 60 will winter there. The location of most of the mines is at an elevation of 4,100 ft; the Mary Blane, on the summit of the divide, being about 1,300 ft higher. Mr. Dean predicts a grand rush of prospectors to the district early in the spring. In his opinion it will be easy to build a road through from North Fork by way of Rattlesnake, the distance being less than 60 miles from Weaverville to the mines. Friday morning we met Mr. Chas. E. Huff, also of New River, and in a pleasant chat with him found that his views exactly coincided with those above expressed.

NEVADA.

Washoe District.

OPHIR.—Virginia *Enterprise*, Nov. 21: The west drift on the 500 level has not yet tapped the openings in the old workings, but it is now close upon them. It is necessary to proceed very carefully, as the material is a thoroughly saturated clay, a thin kind of mud that is liable to give way and run before the the pressure of water standing in the old openings. Some ore is still being obtained from the fillings of the old drifts on the 250 level. On the 1500 level a west crosscut is being run from the south drift. As yet no ore that will pay for working has been found in this cross-cut.

HALE AND NORCROSS.—Good headway is making in the north drift on the 2900 level. The material presents a very favorable appearance. It depends upon the officers at San Francisco to say when the work of cross-cutting shall be commenced on the 2800 and 2900 levels. About the usual quantity and quality of ore is being extracted from the 200 level and from the openings below that level. This ore is being worked at the Eureka mill.

SIERRA NEVADA.—Good progress is being made in the north drift on the 3000 level. It continues to cut streaks of quartz that yield assays of a few dollars a ton. At the 3300 station of the joint Ophir Mexican and Union Con. winze, the diamond drill is now being run to the southwest. The northwest drill-hole was quite wet and the material hard porphyry, with but little quartz.

GOULD AND CURRY.—The west cross-cut on the 825 level at the north line of the Savage was yesterday passing into a new body of quartz of a very favorable appearance. No assay has yet been made of this quartz, therefore its value is unknown. The assays of that beretofore passed through have been from $2 to $5 a ton.

COMBINATION SHAFT.—Rapid progress is making in the excavation of the station at the 3000 level, in which is to be placed the new hydraulic pump. The opening is now so large that the rock may be blasted down very rapidly. The new pump is in readiness for shipment whenever the word is given from here.

ALTA AND BENTON.—The pumps are being run at seven strokes a minute and both baling tanks are also kept going, yet the water appears to be increasing instead of decreasing. The water in the Silver Hill is being drained out and has already been lowered over 200 ft.

YELLOW JACKET.—About the usual quantity and quality of ore is being extracted and sent to the mills. Meantime a considerable amount of prospecting is being done for the purpose of opening up ore in advance of the miners who are engaged in the work of extraction..

CROWN POINT AND BELCHER.—Work is being resumed in these mines, and soon full crews of miners will be employed in both. The repairs to the machinery at the hoisting works, and also at the mills on the river, have been completed.

SCORPION.—The drift on the 500 level is progressing about as usual, with no change of formation worthy of note. The material is still vein porphyry, with occasional seams of clay and some stringers of quartz.

CALIFORNIA AND CON. VIRGINIA.—The usual progress is making in the northwest drift on the 1750 level. As yet no cross-cuts have been run from this

level. As it is running diagonally across the vein, it is in itself in a manner a cross-cut.

EXCHEQUER. —Active explorations are now in progress on both the 600 and 900 levels. On both levels are large bodies of metal-bearing quartz, and the indications are good for finding paying ore at some point.

UTAH.—The repairs to the incline were completed last week and work resumed in the southeast drift. This drift is passing through vein porphyry, showing seams of clay and stringers of quartz.

BEST AND BELCHER.—The west cross-cut on the 825 level at the north line of the Gould and Curry is still in porphyry, but it is becoming very soft, indicating that the vein is near at hand.

SAVAGE.—The E-street tunnel is now about to the point where it will encounter the northern continuation of the ore body that is being worked in the Hale and Norcross.

ANDES.—Work is being done in both the north and west drifts. Quartz of a very favorable appearance is being encountered, but at present no ore is being taken out.

OVERMAN. —Are extracting about the usual amount of ore from the old upper levels, which ore is being worked at a mill on the river.

Bernice District.

LIVELY.—*Silver State*, Nov. 20: We learn from P. Sweeney of Pleasant Valley, who has just returned from Bernice mining district, that it is the liveliest camp of its size in the State. They have struck a foot vein of high grade ore in the lowest level of the Golden Crown mine. This mine is owned by Messrs. Goodel & Williams, who have leased the Bothwell mill for a year. This new strike is at a depth of 300 ft., and it gives them stopes from that depth to the surface from which to extract ore. The mill is a dry crusher, and reduces seven tons of dry ore a day. The miners are paid monthly, and some $3,000 is distributed among them every pay day. There are about sixty men at work in the camp. Some work for the Healey Company, a few are prospecting on their own account, and the rest are at work for Goodel and Williams.

Eureka District.

ALBION VS. RICHMOND.—Eureka *Sentinel*, Nov. 20: The big damage suit of the Albion vs. Richmond wherein the Albion claimed $608,000 for ore alleged to have been taken out of their ground by the Richmond, and tried in the District Court in July last, resulting in a verdict of $13,250 for the plaintiff, will come up again on December 5th, at which time the Albion Company will make their argument on motion for a new trial. The Richmond mine at Eureka, Nevada, is held to be worth $300,000 more than it was sixty days ago. A new ore body has been found between the fourth and seventh levels, some 1,000 to 1,500 feet north of the old workings. There hasn't been time to exploit the new find much as yet. They are running one 80-ton and one 40-ton stack, the latter on custom ore chiefly. The Eureka Con. is being worked by tributers. The Geddes & Betrand is hunting for ore.

Hick's District.

ORE.—Tuscarora *Times-Review*, Nov. 22: R. M. Catlin returned last evening from Salt Lake, where he has been attending to the reduction of a carload of ore, which he recently shipped from his mine at Hick's district. The ore yielded a little upwards of 100 ounces of silver per ton, which was nearly twice as much as Mr. Catlin anticipated. It was not selected as high grade ore, but as samples of the different classes, and for the purpose of ascertaining the average productiveness of the mine. The result was so satisfactory that Mr. Catlin will continue the development of the property this winter, and if present indications are verified, he will recommend the erection of reduction works in the spring. There is an abundance of timber in the immediate vicinity of the mine, which would enable reduction works to be run at less expense than in almost any other mining district in the State.

Rebel Creek District.

SHIPPING ORE.—*Silver State*, Nov. 16: F. P. Snapp shipped some 14 tons of ore from the Onio mine in Rebel Creek district, from this station to Utah to-day.

WILLOW CREEK.—Cor. Eureka *Sentinel*, Nov. 17. Willow creek is looking up. The Ohio mine, recently sold to the "Brooklyn Mining Company," of Salt Lake, has added a half-dozen miners to its force and as soon as a lodging-house for the miners is erected as many more will be put on. The work is being prosecuted under the management of Mr. William Carruthers, an old-timer in White Pine but lately from Salt Lake. A good deal of rich ore is being taken out and the mine promises to be a big one. The mill of the "Silver Wave Company," owned by McColley & McLaren, which recently furnished a two mooth's run under the guidance of a scientific gentleman from Boston named Thompson, is soon to be started up again with Bill Mayon, of Eureka, as superintendent. This company's mines are being opened up under new management, and a few months active development will tell something about their true inwardness. Good miners are scarce. There are plenty of them here, but a great many of them belong to the class who are always looking for work, and praying to God they won't find it. Credit is easy. A little grub—a good deal of whisky and tobacco. A sunny spot in the canyon where the rye grass is thick, and there ambition ceases. With bronzing front, turned to the warm November sun, these brawny fellows, like the girl in the song, "lie dreamiog the happy hours away," spinning Comstock yarns and waiting for a boom, while their claims lie idle on the hill-sides, with the grass-roots hardly injured for next year's growth.

Tuecarora District.

NAVAJO.—No. 2 upraise, south of No. 3 crosscut 150-foot level, has been carried up a distance of 24 ft. The vein looks well and favorable tor an improvement in both grade and quality of ore. The other workings on this level look well at all points, and the usual progress has been make in forwarding the work. The stopes are yielding the usual amount and quality of ore. A crosscut has been started on the 350-foot level for the east vein, 275 ft. south of any of the workings on the upper levels, and is supposed to reach the vein at a distance of 90 feet.

White Pine District.

THE STAFFORD.—Eureka *Sentinel*, Nov. 20: It is cheering to hear from reliable sources that the Stafford mine, White Pine district, is yielding handsomely now; that the property is in fine working order, and that its prospects for the future are brighter than ever before. We have already given the opinion of R. D. Clark and Capt. Frank Drake to this effect. The views of these first-class mining men will probably be proved to be correct in due time. Developments are being made systematically and at the least expense. By next spring or summer we may confidently expect to find their prediction of a genuine old-time bonanza fully verified. Eugene N. Robinson, the manager of the Sweetwater Company's property, superintends all work personally, and with noteworthy intelligence and industry. The amount of bullion shipped from the Stafford in October was $12,544.64, and for November, to the 17th inst., $8,214.40. The total production of bullion up to the latter date was $74,555.80. Every indication is favorable for a largely increased bullion output next season. Among the important steps recently taken to develop the mine, is the letting of a contract by Manager Robinson to run in on the Wheeler Tunnel 413 ft. This will extend the claim through the Hidden Treasure patent at a depth of 497 ft.

NORTH BELLE ISLE.—*Times-Review*, Nov. 20: There are no material changes to report on the 70-foot level. The vein continues to develop favorably.

BELL ISLE.—The joint line upraise on the 250-foot level, has connected with the 150-foot level. A line upraise will now be carried up from the 150-foot level.

INDEPENDENCE.—West drift, 400-foot level has been advanced 16 ft. during the past week. Total length, 318 ft.; stopes north on the 300-foot level show material improvement.

GRAND DUKE.—East crosscut from 400-foot level is in seventy-five ft.; work for the present suspended there, and have resumed work in the south drift. Have started an upraise from the 400 which is up 34 ft. Have started an upraise above the 300-foot level, which is up 15 ft. The stopes are producing sufficient ore to keep the mill running.

NEW MINING ENTERPRISE.—Nevada *Transcript*, Nov. 22: Washington township will within the next 60 days have another extensive quartz mining enterprise in full blast if the weather remains pleasant a few days longer. The Cornucopia and Secret Treasure locations, coosolidated as one claim, and situated just below the Yuba mine, but on the opposite side of the river, will be the scene of the operations. The gentleman in charge of the property have for three years past had men at work there off and on prospecting the four ledges that traverse the ground, and most encouraging developments have been made by means of the numerous tunnels run and shafts sunk. The reporter was yesterday shown specimens of the ore taken out, and some of them were thickly impregnated with coarse free gold. Samples of the average quartz taken out have been milled and yielded from $15 to $20 per ton in free gold. A large force of men are now at work grading for a 10-stamp mill, the batteries and stamps of which has been purchased at the Union Iron Works, San Francisco, and will be shipped to-morrow. The balance of the machinery and the water pipes will be procured at this city. The lumber has been ordered from Towle Brothers, and Con. Grissell commenced delivering it yesterday. Mr. Grissell has a number of teams at work. Joseph Everett of Grass Valley has charge of the erection of the mill, which is to run by water power, and he proposes to have everything ready if possible to begin crushing about the middle of January.

ARIZONA.

RIVERSIDE NUGGET.—*Silver Belt*, Nov. 20: Mineral creek bids fair to soon be one of the leading mining camps in Arizona. The Ray copper mine, we are informed, show a large body of 10 per cent ore. Hoisting works have been erected and a fine mill for concentrating has lately been completed, and will soon be put in motion. The company intend hauling the concentrations to their smelter near Riverside. The Keston copper mine, owned by Messrs. Haley, Walker and others, is considered one of the most promising in the district. Several thousand tons of rich ore are now exposed, and with the erection of the proper machinery the mine can soon be made one of our greatest bullion producers.

COPPER.—Tombstone *Epitaph*, Nov.20: A rich rich strike is reported in the new shaft of the Copper Queen mining company, in the Czar ground, adjoining the famous Queen. At a depth of 250 ft a large body of oxides and native copper has been encountered, as rich as anything previously discovered. This important news was brought in from Bisbee last evening. The celebrated Silver King mine has at last paid another dividend, after a cessation of more than a year. The shaft is down a little over 800 ft, but no sinking has been done for sometime, there being a large quantity of ore yet to extract in the upper levels. The resumption of dividends will doubtless be followed by a rise in the stock, which has fallen to $4. The mine is running its own 20-stamp mill at Pinal, also a 5-stamp mill of the Windsor Company, at the same place. It turns out bullion from the latter and concentrations from the former.

COLORADO.

NOTES. — Colorado *Mining Gazette*, Nov. 20: Measone & Co. have made some very rich discoveries up Chicago creek this week. The new Bailey mill, on Squirrel gulch, has closed down for temporary repairs. Meade & Camp shipped a quantity of galena ore from the Niagara lode, Spring gulch, this week. Prospecting is lively this fall on Chicago creek, and some excellent ledges are being opened up. The Kitty Clyde mine is producing in the neighborhood of $2,000 per month from surface working. The Crystal, Tropic, Victor, Queen, Freighters' Friend, Gem and Garden are all producing mines on Seaton mountaio. Two hundred tons of smelting ore has been shipped to the smelters so far this month the Public Sampling Works. One mill run, from surface quartz on the Kitty Clyde mine, Spring gulch, treated at the Public Sampling Works, rao 5 ounces in gold to the ton. Extensive development is taking place on the Grover Cleveland lode at the head of Virginia canyon. This property has produced good pay from the grass roots. Work is being vigorously pushed on the Fraction lode, and regular shipments are being made. This fine property never looked better than at the present time. A renewal of operations on the Little Mattie mine has begun under the charge of Mr. George A. Chipman, as superintendent, and Mr. Alfred Rickard, as consulting engineer. Mr. Sheater, manager of the Cottan mine, Gilpin county, was over this week, he was exhibiting some very beautiful free gold specimens taken out from the lower workings of the mine.

CRYSTAL CITY.—Elk *Mt. Sun*, Nov. 20: A. I. Hull, superintendent of the Mendocino Mining Co., has started for his home in Denver, and intends to return in the spring to develop their property. Geo. Melton has just returned from a trip to Aspen, and says he would rather remain here than try his luck in that camp.

The Aspen *Sun* says: The Montezuma and Borealis, of the Tam O'Shanter group of mines above Ashcroft, have forty men working in the various openings and on improvements. About twenty men are engaged in taking out ore, and the rest are employed in developing the properties. The ore runs over one hundred ounces, and some is treated at Gunnison, Denver, Pueblo and Aspen. It is a very desirable ore for smelters.

IDAHO.

CRUSHING.—Idaho *Statesman*, Nov. 19: Mr. H. A. Mattox, just down from Quartzburg, Boise county, says that the Gold Hill mill has recently made a crushing of ore from the Pioneer ledge, located 200 feet below the Gold Hill mine, with a remarkably good yield. They think the Pioneer ledge will prove as good as the Gold Hill, and will put on a strong force, and run the mine and mill all winter. If success follows the further working of the Pioneer ledge, it will give an impetus to business in Quartzburg, and make times as lively as they ever have been. The shutting down of the Gold Hill mine was on account of the bursting of a portion of the pump, and they were obliged to take the pump out, as the mine would fill up before they could send to San Francisco and get it repaired. The mine was paying good dividends when it was shut down. The present pump had to hoist the water 400 feet. This is considered too heavy a lift, and the probability is they will put in two pumps to do the work when they start up again. Mr. Mattox has worked in the mine a great deal, and says it is as good as it ever was, and there are no signs that the mine is giving out.

CLEAN-UP.—Idaho *World*, Nov. 20: A clean-up was made at the Forest King mine the latter part of last week. About one hundred and twenty-two tons were put through, and the clean-up is estimated at between four and five thousand dollars. The dust will be sent to the assay office at Boise City. The ore that was put through was taken from the upper works of the mine. The ore in the lower tunnel is believed to be richer than that above.

THE QUEEN OF THE HILLS.—Wood River *Times*, Nov. 22: Quietly and without any boasting, the Queen of the Hills mine, near the Minnie Moore, is yielding up her wealth to her owners. Employing about 50 men, her yield is nearly equal to $1,000 per man per month. Last month she yielded $35,000 worth of ore, and this month she will do better. This, while the prospecting work is kept ahead of the stopes sufficiently to insure steady production for an indefinite period. The Queen has, like our other Wood River mines, paid from the grass roots, for not only prospecting, but for a first-class hoisting and concentrating outfit, and she is now in shape to justify hopes of long-continued production.

THE MINNIE MOORE.—All accounts against the Minnie Moore mine bave been balanced, and the English syndicate which purchased the property last spring is now io full control of it. The management is also in much better shape to meet all demands than at any time since the purchase. Heretofore 80 per cent of the ore extracted was sold "in eschow," leaving only 20 per cent of the yield available for working purposes. Now, the position is reversed—80 per cent will be used for development work, if needed, and 20 per cent sold "in eschow," or laid up to declare dividends. The mine has large reserves of ore in sight, and indications are that before many months the Minnie Moore will rank among the great producing mines of the world.

THE MAYFLOWER CO.—After a suspension of about ten days, work at the Mayflower mine and concentrating works was resumed in full a few days ago. Operations were suspended because the Eastern capitalists interested in the property had drawn out the surplus in McCormick's bank, contrary to the wishes of superintendent Havens. The surplus having been returned, the works were started up again.

GENERAL NOTES.—Idaho *Keystone*, Nov. 15: Mr. Winters returned from his trip up the river on Monday, and brought in some sand from the claim he is interested in. The claim is what is known as Missoula bar, and was located in 1866, but was afterwards abandoned. It is said to be very rich. He shipped a quantity to parties in Ogden, who are negotiating for the purchase of the property. Work is still being prosecuted on the Peck mine, and, as a consequence, it is being developed into a good mine, some of the ore being very rich. The mine is being well timbered, and the work will be continued throughout the winter. Col. Wall has commenced a tunnel, which is intended to tap the Bullion vein at a depth of 700 feet. Ore has been found in a new place in the General Custer mine, at Custer, which guarantees the mill another year's work at least. Tim Kennaly, who is doing some work in the Mayflower mine, on contract, has just put on a force of 12 or 13 miners, and may increase that number soon. United States patents have just been issued to Wm. H. Greenhow and others, for the Joaquin lode; to C. J. Johnston and others, for the Red Wing lode; and to the Vienna Mining Company, for the Justice lode, and mill-site. All in Alturas county.

MONTANA.

MADISON COUNTY MINES.— *Inter-Mountain*: From Mr. Gus. Gade, who has just returned from the Tidal Wave district, we have been able to gather the following details of a district in which Butte parties are interested to some considerable extent: The Tidal Wave has changed hands, Chas. Gideon disposing of his half interest to Fred Root. The property is developed by three tunnels, in the middle one of which operations are now being prosecuted by the sinking of a winze on the vein, a depth of 40 ft. having now been reached, at which point, the vein shows an ore body 2½ ft. wide, averaging about $135. Regular bi-monthly shipments of assorted rock, are made to Omaha, where the product is milled. Only the best of the ore is utilized in this way, as the nearest railway point is Dillon, a distance of 40 miles, which necessarily entails considerable expense. In Georgia gulch, is located a band of claims, on the same belt, that bid fair, from present indications, to attain prominence, and will be known to fame by the titles of Saturday Night, Magnolia, Lulu, Wolverine, and Fusilade. The Saturday Night has been prospected by two tunnels, of the different lengths of 25 and 60 ft. The property is owned by Capt. Johnson, who will prosecute developments during the winter. The vein at present shows a width of 12 ft., on the hanging wall of which is a very rich streak of carbonate character, 15 in. in width, assaying 65 per cent. lead, and 150 ounces in silver.

The Magnolia, owned by Hathaway & Co., has been developed by two tunnels, each having attained a depth of 100 ft. In the eastern tunnel, sinking to uncover the lead was prosecuted, which, when uncovered, showed up a rich three-foot carbonate vein. Operations at this point, however, were temporarily abandoned on account of the presence of too much water, and work is now being prosecuted in a drain to tap the vein 80 ft. below, which will afford the necessary relief. The work is being done with the force of four men, and the development will be pushed during the coming winter. The product of last winter, amounting to about 176 tons, was shipped to Omaha for treatment, and the mill returns show an average of 60 per cent lead, 25 ounces in silver, and an ounce and a half in gold. The Lulu and Wolverine, owned by Amos Purdam and Mr. Bartruff, are supposed to be an extension of the bonanza encountered in the Saturday Night, but work this season, bas been confined to slight extensions of the tunnels by which they are developed. The Fusilade, owned by Mr. G. Gade, an old-time miner from Nevada, is the last location, as yet, taken on the belt, on which are located the four claims mentioned above, it is developed by a shaft 50 ft. deep, the deepest sinking yet attained on this particular belt, but on account of foul air, operations were suspended, and work on a tunnel 150 ft. lower down, was commenced. The tunnel, in which is the lead, has now attained a length of 65 ft., and last week, a body of carbonate ore was encountered, which promises to equal any that has been found in this section of the country.

NEW MEXICO.

NOTES.—Silver City *Enterprise*, Nov. 21: A rich strike is reported to have been made at Steeple Rock, the particulars of which we have not yet heard. The Kingston Clipper says that the Brush Heap mine, owned by Elliott and Forbes, cannot procure teams enough to haul away their ore. Two cars of ore are weekly shipped from the Bullion mine, of the same camp. A large body of water was encountered in the Cariboo mine at Fleming, Tuesday, at a depth of 50 feet. A pump was immediately put upon the mine, and arrangements made to continue drifting in the direction of the contact. The claim is looking splendidly. There are already fifty persons in the camp called Clark, in honor of Adam Clark, the discover, in the Swisshelm mountains. Two Colorado experts are reporting on the property this week. Every mining man who has visited the Great American mine, with whom we have conversed, agree in the belief that it is a great property.

The owners of the Grey Eagle mine have enjoined the Rose people from further work on that claim. The papers were placed in the hands of the sheriff yesterday. This is the claim in the Bullard's Peak district that created so much excitement upon the discovery of native silver upon it last year. There are two claimants for it, one known as the Rose party and the other as the Grey Eagle party. There has been less claimed for Malone and Gold Hill, and less "blowing" about the rich strikes made at these places, for the actual mineral in sight, than any mining camp in the world. At Malone there are seventeen claims that can ship paying ore from grass roots, and at Gold Hill a man can make fair wages by simply pounding up the rock and washing out the free gold.

UTAH.

SALT.—Salt Lake *Tribune*, Nov. 15: Ever since this valley was first settled, salts have been collected along the shores of the lake for domestic and mechanical purposes. Salt works have been established at various places, but the most of it has been collected in sloughs where by evaporation it deposits on the ground. About all the salt now collected is for the use of the silver mills, which consume about 18,000 tons per annum, as follows: Utah uses about 5,000 tons, Idaho 3,000 to 5,000, Montana 6,000 to 8,000, and Colorado about 500 tons, drawn from the lake. The price, loaded on the cars, averages about $4 to $5 per ton.

REVIEW.—Salt Lake *Tribune*, Nov. 21: The week has seen the interruption of the fine weather by a rainstorm, but the output of the mines, mills and smelters has been good. For the week ending Saturday, November 15th, inclusive. the shipments from Salt Lake city were 1,248,412 lbs. The receipts of bullion and ore in this city for the week ending November 19th, were: Bullion, $147,265.94; ore, $20,400; total, $167,665.94. For the week previous, the bullion receipts were $113,743.26; ore, $12,800; a total of $126,543.26. The Horn Silver sent in during the week last named, nineteen cars of bullioo, valued at $57,000, bringing its total output for the year to date, $2,298,000. The product of the Ontario for the week was sixty-nine bars of bullion, assaying $45,942.88. Total products of the Ontario this year to date, $1,493,416.95. Sales of its stock in New York for the week ending Nov. 14th, 75 shares, at $19.00 to $19.37½. The Crescent sent down three cars of ore, $7,250. The Christy sent up from Silver Reef, three bars of silver, $5,050, and the Stormont two bars, $2,070, making $8,020 from the silver sandstones for the week. One car of Day bullion was received, $4,344.06. The product of the Hanauer smelter for the week was nine cars of bullion, $20,800.

About Obtaining Patents.

Patents are Virtually Contracts

Between inventors and the public. The consideration flowing from both parties to the contract is expressly fixed by statute. The Government requires the following consideration in every case: First, that an applicant for a patent shall disclose a new and useful improvement, of which he is the first and original inventor. Second, that the invention has not been patented, or published in a printed publication prior to the date of his *invention*. Third, that the invention has not been in public use, or on sale, more than two years prior to his application for a patent. Fourth, that the invention shall be properly described and claimed in the specification forming a part of the patent. Provided an inventor complies strictly with these conditions, the Government guarantees that the inventor shall have the exclusive right to make, use and sell the thing invented for the term of seventeen years.

The Patent Law provides that in case a patent, which is the evidence of the contract, is not executed in compliance with the requirements of the law, it may be annulled and rendered void. Hence, it is of the greatest importance to every inventor that his patent or contract be skillfully and accurately drafted, that it may afford him complete protection for his invention during the life of his patent.

Secure a Good Patent.

An inventor should first ascertain whether or not his improvement has been patented to another. This requires an exhaustive search among all the patents in the class to which the invention relates. This question can often be answered gratuitously by us, immediately on receiving full information of the invention, by reason of our long and extensive practice as patent solicitors and editors and publishers of first-class, scientific and industrial journals, during the past 20 years and over. When the question of priority of invention is not so readily to be determined, it is generally best to make what is termed a "preliminary examination," by searching through the patent office reports among the patents in the class to which the invention relates, and referring to our extensive patent library, containing compilations of special classes of American and foreign inventions, mechanical dictionaries, scientific encyclopedias, files of scientific and mechanical newspapers, and an immense number of patent applications by inventors of the Pacific coast, carefully filed by this office since 1860.

If, by this "preliminary examination," the improvement is found to have been previously invented, our client will receive, for the small sum of $5 for the examination, a verbal or written report showing definitely whereby his invention has been anticipated, thereby saving him further expense and perhaps much time, useless delay, anxiety, etc.

To avoid all unnecessary delay, however, in securing patents at the earliest moment practicable, inventors will do well to forward a model, drawing or sketch, with a plain, full and comprehensive description of their invention (stating distinctly what the particular points of improvement are), with $15 as a first installment of fees. If the improvement appears to us to be novel and patentable, the necessary papers for an application for a patent will be prepared immediately, and forwarded to the inventor for his signature. When the inventor receives the application and finds it duly prepared, he will carefully sign and return the same plainly addressed to us, with postal money order or express receipt for our own fee. The case will then be promptly filed by us in the Patent Office, and vigorously prosecuted to secure the best patent possible. [This course is the most expeditious and satisfactory, as no time is lost in transmitting correspondence relative to the preliminary steps to be taken.] When the patent is allowed the inventor will be duly notified, and on sending the final Government fee of $20 to us, we will order the issue of the patent, and forward the same as soon as it is secured from the Patent Office.

The payments are thus divided and made easy. We make no pretense of doing cheap work, in order to entice custom, nor do we afterward make additional charges to bring the bill up to a fair compensation. We do our work honestly and thoroughly, and we never give a case up as long as there is a chance to obtain a patent. The Agency charge is from $25 to $30, or sometimes more, if the invention is intricate or complicated, or requires much labor. Drawings cost from $5 upward, according to their number and the time employed, and, if a model is sent, the express charges upon this and the papers must be added. The total cost, in addition to Government fees, rarely exceeds $40, and for this we do all we can without appealing the case.

When the invention consists of a new article of manufacture, or a new composition, samples of the separate ingredients sufficient to make the experiment, and also of the manufactured article itself, must be furnished.

Models and Drawings.

Models are now seldom required by the Commissioner of Patents, and generally only in intricate cases. Perfect drawings of practical working machines are considered more satisfactory to the Patent Office than the old and more cumbersome system of storing up an immense bulk of almost numberless models.

Drawings or sketches, sufficient to illustrate clearly the invention, with a sufficient description to enable us to make a full set of perfect drawings for the Patent Office is all that we require. A model will answer our purpose as well to verify, in cases where the inventor can more easily furnish it for our use.

The value and even the validity of a patent often depends on the character, clearness and sufficiency of its drawings. There are thousands of existing patents in which the improvements are but partially or very poorly illustrated in the drawings. When an attempt is made to dispose of such patents, the vagueness and defects of the drawings often prejudice capitalists and manufacturers against the invention while in reality it may be of great value, and would meet with ready sale had the invention been fully portrayed by artistic and skilfully executed drawings. Again, when patents of this character are brought into court, the uncertainty and ambiguity of the drawings enable the opposing experts to mystify the judges as to the construction or combination of parts intended to be covered by the patentee. In all cases prepared by us, the drawings are made under our personal supervision, by skilled draftsmen in our constant employ, and every precaution is taken that the invention is fully and clearly shown by different views, so that the improvement will be readily understood by the Examiners in the Patent Office, and comprehended by the public when the patent is granted.

In the Patent Office

The application is assigned to the Examiner having charge of the class to which the invention relates. The case must then take its turn with others in the order of filing, and in due time is carefully examined to test the novelty of the invention. If the examiner fails to find anything that anticipates the invention, a patent is immediately allowed, provided the specification and claims are drafted in proper form. Should the Examiner find a prior patent which, in his opinion, anticipates one or more of the claims in the application, a letter or rejection is sent to the attorney in charge of the case; and, if the attorney coincides with the views of the Examiner, the claims rejected are erased. In preparing applications for patents, an attorney should be careful to familiarize himself with the class of inventions to which the application pertains, so that the specification and claims may be drafted as nearly perfect in the first instance as is possible. This course saves much time in prosecuting the application to a patent.

When claims are improperly rejected on patents which do not anticipate the spirit or wording of the claims, proper steps are immediately taken to convince the Examiner of his error. This is done, in most part, by personal arguments, as the differences in construction, operation, function and results are more readily discovered and appreciated by an oral presentation of the facts than can possibly be done by relying solely on written arguments. In order that the Patent Office record of the patents shall be complete, an oral argument is generally supplemented by a manuscript brief, that others, in examining the files at any future time may clearly comprehend the position taken by the Examiner and attorney in prosecuting the case to patent.

In addition to our own personal attention to the interest of our clients here, we have, for over 12 years past, had constantly in association with us in Washington, one of the soundest legal counselors and ablest of practitioners in patent business in this country, who carefully attends in person to our business at the Patent Office, and has attained success in a most marked degree.

Perfect Claims.

The value and force of a patent are dependent on its claims. A patent may disclose to the public the most important and valuable invention, and yet the claim be of such meager scope that the patent is actually worthless. When the claims of a patent are so loosely drafted that infringers can flood the market with improvements, differing from the improvement disclosed by the patent only in slight changes in construction and arrangements of parts, such a patent is valueless to the owner, as it fails to afford him that exclusive and complete protection guaranteed by the Patent Law. Hence it is that the greatest care, skill and perseverance are required, first, in properly drafting the claims in the first instance, and second, in prosecuting the application before the Patent Office, and maintaining the rights of the inventor to claims as broad and sweeping as the invention will warrant. This latter is no easy task. The Examiners of the Patent Office serve in the capacity of attorneys guarding the interests of the public. It is their sworn duty to exercise the greatest care and watchfulness, that patentees do not secure claims of greater scope than they are justly entitled to. It is but natural that Examiners are sometimes in error as to just what scope should be accredited an invention. Although the Examiners act under honest convictions in cases where they refuse an inventor his just rights, yet it is the duty of the attorney to maintain the claims of his client, if he is convinced that they are just and proper. To succeed in this requires the display of tact, firmness and ability; and when the Examiner is made to see that the inventor is honestly and fairly entitled to the claims which have been rejected, he will almost invariably recede from his former action, and allow the case.

Advantages to Inventors on the Pacific Coast.

The firm of DEWEY & Co. (continuously editors and publishers of the MINING AND SCIENTIFIC PRESS, nearly from its early commencement in 1860) offer comparatively far better facilities to the local inventors of the Pacific States and Territories than are possessed by any other agents in America. Members of the firm give personal attention to the applications entrusted to their care. They have been longer in practice in patent soliciting than most agents who are still personally engaged in the business. They have secured more U. S. and foreign patents in the past 20 years (with very few exceptions) than any other firm still existing. Their practice has been so successful and long continued, that the great majority of inventions on this side of the American continent have been patented through their agency, thus affording them great and valuable experience, by thorough information of the true principles and points of novelty in the inventions, whether general in character or peculiarly local to this coast.

The extensive business combination and experience of this firm is undoubtedly one of the most fortunate in existence for affording inventors prompt and reliable advice, and the best possible facilities for securing their full patent rights with safety and dispatch at uniformly reasonable rates.

Every patentee of a worthy invention is guaranteed the gratuitous publication of a clearly-stated and correct description of his invention, in one or more of our influential and reliable newspapers, affording just the circulation that is best calculated to widely inform the class of readers most specially interested in the subject of his invention.

Saving of Time, Etc.

Inventors on this coast will find that owing to our familiarity with inventions and local affairs of this coast, we can more readily and fully comprehend their wants, and thus save much of the time ordinarily consumed in preliminary writing back and forth when distant agencies are employed.

Caveats.

A Caveat is a confidential communication made to the Patent Office, and is therefore filed within its secret archives. The privilege secured under a caveat is, that it entitles the caveator to receive notice, for a period of one year, of any application for a patent subsequently filed, and which is adjudged to be novel, and is likely to interfere with the invention described in the caveat, and the caveator is then required to complete his application for a patent within three months from the date of said notice. Caveat papers should be very carefully prepared. Our fee for the service varies from $10 to $20. The Government fee is $10 additional.

To enable us to prepare caveat papers, we only require a sketch and description of the invention.

Rejected Applications.

Inventors who have rejected cases (prepared either by themselves, or for them by other agents), who desire to ascertain their prospects of success by further efforts, are invited to avail themselves of our unrivaled facilities for securing favorable results. We have been successful in securing Letters Patent in many previously abandoned cases. Our terms are always reasonable.

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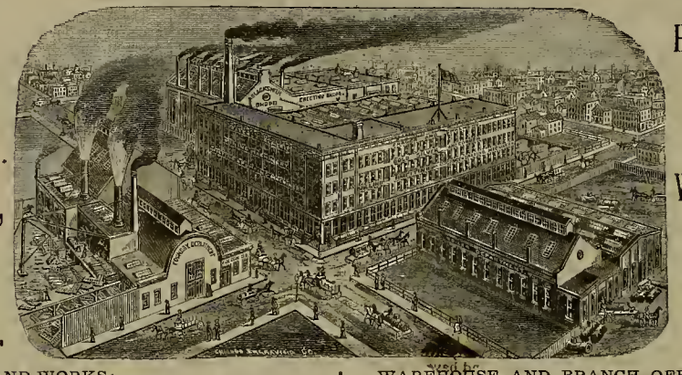

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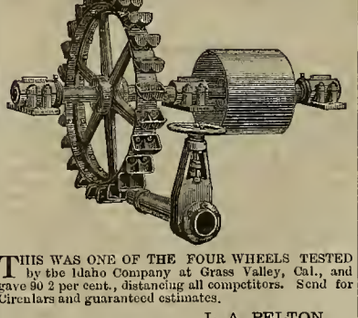

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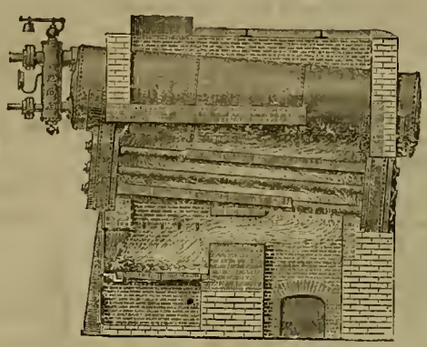

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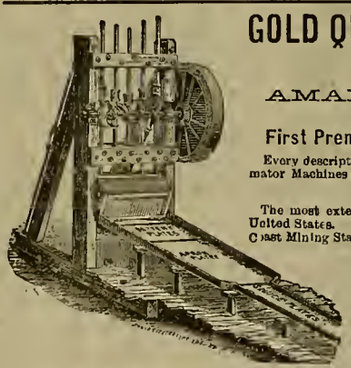

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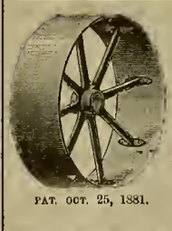

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BOUND VOLUME OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce, and valuable for future reference and library use.

An Important Mission.

The Commission authorized at the late session of Congress to visit Mexico and the Central and South American Governments, with the view to gather information which may lead to an increase of trade between those countries and our own, have entered upon their work in a most intelligent and energetic manner. After spending several weeks in consultation, personally and by letter, with various men in various sections of the Union east of the Rocky mountains, and thoroughly acquainting itself with the present *status* of our business relations with the countries referred to, and ascertaining, so far as possible, from our standpoint, what can be done to further develop the trade, reached this city November 19th, and held several consultations with our leading merchants in furtherance of their mission. Immediately upon notification of their expected arrival, arrangements were made for the collection of whatever information could be obtained which might assist them in their work. Notwithstanding the brief notice given for a conference of so important a character, about seventy-five of our leading merchants, manufacturers and bankers met and decided, as a program for the conference, to invite prominent gentlemen to prepare papers on such subjects as it was thought the Commission would desire information. Upon only two or three days' notice, the following papers were prepared and submitted to the Commission:

Programme.

"Machinery and the Iron Trade"—Irving M. Scott and L. B. Benchley.

"Wine"—Arpad Haraszthy and Charles Kohler.

"Canned Goods"—William T. Coleman and Sidney M. Smith.

"Woollen Goods"—William Harvey.

"Dried Fruit"—George W. Meade.

"Transportation"—B. Mozley.

"Coffee, Sugar, etc."—Edward L. G. Steele.

"Lumber"—A. D. Moore.

"Cereals"—Horace Davis.

"Banking"—P. N. Lilienthal.

"Dry Goods"—John Deane.

"Boots and Shoes"—M. A. Hecht.

"Central and South American Trade in General"—J. M. Roma and Eugene de Sabla.

The Commission, which consists of George H. Sharpe, of New York, Thomes C. Reynolds, of Missouri, and Solon O. Thatcher, of Kansas, with William E. Curtis as Secretary, met in conference at the rooms of the Chamber of Commerce the day after arrival. Hon. Horace Davis was appointed Chairman of the Joint Committee of Commerce. At the suggestion of the Committee, Mr. Curtis presented the nature of the work by a brief statement of the principal obstacles that have stood in the way of the extension of trade to the Central and South American States, as they had been elicited by the commission, at hearings in the principal commercial cities in the East. These obstacles, he said, are:—

Obstacles to Trade.

First—Lack of direct regular communication, which is the key of the problem.

Second—Lack of knowledge on the part of manufacturers of the wants of the South American and Central American markets. Manufacturers, when they have had a surplus, have unloaded in these markets, but they have not manufactured expressly for these markets. There is complaint that goods for these markets are not put up properly.

Third—The Consular service of the United States in Central and South American States is very defective. There are few American Consuls there, while France and England are well represented everywhere.

Fourth—A lack of banking facilities, which must follow trade. There are no banking facilities until there is trade. We pay taxes upon every dollar's worth of goods (at least this is so in the East) sold in South and Central American States to English bankers.

The Business of the Convention.

On the part of the citizens, was opened by the reading of several articles on the export trade of California and the commercial relations of the State with Central America, etc., one of which contained a summary of the business for the past twenty years. After the reading of these preliminary papers the program of papers, as given above, was read and interspersed with remarks bearing upon the various subjects as they were presented.

The subject of reciprocity was also considered *pro* and *con*. The matter of transportation and exchange and exports was also discussed at considerable length by B. Mosely, General Manager of the P. M. S. Co.; Chas. A. Wetmore, Chief Officer of the California State Viticultural Commission, on invitation, addressed the Commissioners in behalf of the vine-growers, who are decidedly opposed to reciprocity. A paper on "Live Stock," not in the program, was read by Rollin P. Saxe.

The papers, although prepared in great haste, were well written and contained a vast amount of information, which will be of great use to the Commission in aid of their work.

Before Leaving New York

The Commission visited General Grant at his home, and held quite a lengthy and very important interview. The General had made the subject of our trade with Mexico a subject of much study during the past two or three years, and has made several trips to that country in the furtherance of his investigations. General Grant made several important suggestions, and imparted information which was considered of special value by the members of the Commission.

Importance of the Mission.

It is of paramount importance, at this time, that every possible effort should be made by this country to secure a larger portion of the trade than has hitherto fallen to us. We are now heavily handicapped in the commercial race with Europe in almost all parts of the world, but from information gained within the last year or two, through our Consuls abroad, and from other sources, no doubt exists but that our foreign trade can be largely increased in many directions and upon all four continents. Something may, no doubt, be done in the way of possible treaties, but more can be accomplished by united and intelligent action on the part of our merchants and manufacturers.

The Interest of the Pacific Coast

Centers largely in an increase of business with Western Mexico, with Central America and the Pacific Coast States of South America. The Commission will no doubt be able to collect a large amount of information which will be valuable for our merchants and manufacturers both here and at the East, and which may also lead to important congressional action. Its labors will probably result in throwing a strong calcium light upon the whole subject of international trade on this continent, and the final report of the Commission will be awaited with much interest.

Complimentary to California.

Judge Thatcher, Chairman of the Commission, at the opening of the conference, after expressing his regret at the short notice which circumstances compelled them to give of their visit to this city, remarked that he wished to join with Governor Reynolds in homage to the wonderful developments of this wonder of the Pacific Coast, San Francisco.

Departure of the Commission.

The Commission left the city on Monday afternoon, Nov. 24th, in a special car, for the city of Mexico, where they will remain until after the inauguration of President Dias, after which they will accompany the new President to New Orleans, where he will assist in the opening of the Exposition Dec. 16th. From New Orleans the Commission will proceed by sea to Guatemala, thence to San Salvador, thence to Honduras, thence to Nicaragua, thence to Costa Rica, thence across the Isthmus of Panama to Venezuela, theuce to the United States of Columbia, thence to Ecuador, thence to Bolivia, Peru and Chili, thence across the Andes to Mendoza, thence to the principal points of the Argentine Republic, and thence home by way of the leading ports of Brazil.

Our Agents.

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A. C. KNOX—Nevada State).
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COMPANY.	LOCA	N. NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M & M Co	Alaska	8	70	Oct 14	Nov 15	Dec 5	E F Stone	306 Pine st
Butte Creek Hyd M Co	California	10	10	Sept 23	Nov 6	Nov 29	R L Taylor	309 Montgomery st
Best & Belcher M Co	Nevada	31	50	Nov 21	Dec 30	Jan 19	W Willis	309 Montgomery st
Champion M Co	California	17	10	Nov 24	Dec 28	Jan 19	T Wetzel	322 Montgomery st
Caborca M Co	Mexico	9	03	July 18	Nov 1	Dec 1	O Bone	328 Montgomery st
Chollar M Co	Nevada	15	60	Oct 29	Dec 2	Dec 23	C L McCoy	309 Montgomery st
Con Va & California M Co	Nevada	1		Nov 5	Dec 13	Jan 3	A W Havens	309 Montgomery st
Crocker M Co	Arizona	1		Oct 31	Dec 2	Dec 23	A Watermau	309 Montgomery st
Day S M Co	Nevada	15	75	Sept 26	Nov 3	Dec 2	E M Hall	327 Pine st
Gould & Curry S M Co	Nevada	49	50	Oct 25	Nov 29	Dec 22	A K Durbrow	309 Montgomery st
Grand Prize M Co	Nevada	17	36	Nov 24	Dec 30	Jan 28	E M Hall	327 Pine st
Golden Fleece G M Co	California	34	40.00	Oct 13	Nov 18	Dec 8	F Schirmeler	412 Sixth st
Indian Spring Drift M Co	California	4	05	Nov 21	Dec 22	Jan 21	A B Paul	328 Montgomery st
Lamphire G M & M Co	California	1	10	Oct 3	Nov 17	Dec 8	A Martin	526 Montgomery st
Lewis Con M Co	Arizona	5	03	Nov 14	Dec 22	Jan 19	J W Pew	310 Pine st
Mayflower Gravel M Co	California	27	10	Nov 20	Dec 23	Jan 12	J Morizio	328 Montgomery st
Marshall M Co	California	2	10	Nov 6	Dec 15	Jan 5	A L Perkins	310 Pine st
Mexican G M Co	Nevada	28	50	Nov 11	Dec 17	Jan 8	C E Elliott	309 Montgomery st
Ophir M Co	Nevada	48	50	Nov 12	Dec 17	Jan 6	E B Holmes	309 Montgomery st
Rainbow M Co	California	12	15	Oct 24	Dec 1	Dec 29	P F Marbardt	311 Montgomery st
Standard M Co	California	1	25	Oct 17	Dec 1	Jan 5	W Willis	309 Montgomery st
Sierra Nevada S M Co	Nevada	80	50	Oct 22	Nov 26	Dec 25	E L Parker	309 Montgomery st
Savage M Co	Nevada	61	50	Nov 11	Dec 15	Jan 5	E B Holmes	309 Montgomery st
Utah S M Co	Nevada	51	50	Oct 23	Nov 28	Dec 16	G C Pratt	309 Montgomery st
Union Con M Co	Nevada	28	50	Nov 5	Dec 9	Dec 30	J M Burlington	309 California st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Butte Creek Hyd M Co	California	R L Taylor	230 Montgomery st	Annual	Dec 1
Eintracht Gravel M Co	California	H Kunz	209 Sansome st	Annual	Dec 2
Gould & Curry M Co	Nevada	A K Durbrow	309 Montgomery st	Annual	Dec 15
Head Center & Tranquility M Co	Arizona	J W Pew	310 Pine st	Annual	Dec
Mexican M Co	Nevada	C E Elliott	309 Montgomery st	Annual	Dec 2
Mount Diablo M Co	Nevada	R W Heath	318 Pine st	Annual	Dec 15

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	B L Burling	328 Montgomery st	50	Dec 5
Derbec Blue Gravel M Co	California	T Wetzel	322 Montgomery st	10	Oct 8
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Nov 13
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Nov 28
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Nov 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Nov 6

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Nov. 6.		WEEK ENDING Nov. 13.		WEEK ENDING Nov. 20.		WEEK ENDING Nov. 27.	
Alpha	.90	1.10	.95	1.00	.65	.90	.75	.80
Alta	.85	1.35	.75	1 20	.55	.75	.30	.55
Andes	....	.30	....	.30	....	.25	.20	.35
Argenta	....	.05	....	....	....	....	....	.10
Belcher	.60	.70	.70	1.45	.45	.65	....	....
Belding	....	....	....	....	....	....	....	....
Best & Belcher	1.50	1.70	1.30	1.70	1.00	1.30	1.00	1.10
Bullion	....	.20	....	.25	.15	.75	....	....
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	....	.50	....	.25	.25	.30	....	....
Bodie Con	2 05	2.75	2.45	3.00	2.90	3.20	2.55	3.15
Benton	.26	.35	.20	.30	.15	.20	.10	.15
Belle Tunnel	....	....	....	....	....	....	....	....
Bulwer	.35	.55	.55	.60	.40	.50	....	.40
California	.25	.40	.15	.30	....	....	....	.10
Challenge	....	.15	....	....	....	....	....	....
Champion	....	.30	....	....	....	....	....	....
Chollar	1.95	2.25	2.10	2.35	1.35	1.75	1.70	1.90
Confidence	....	.80	....	.70	.50	.65	....	....
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	.25	.40	.15	.30	.10	.15	....	.10
Con. Pacific	....	.90	....	.95	.90	.95	.90	.95
Crown Point	.90	1.25	1.00	1.05	.55	.80	.75	.80
Day	....	....	....	.75	....	.75	....	.75
Eureka Con	....	2.95	....	3.00	....	....	....	2.90
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	.05	.20	....	.15	.20	1.00	.13	.15
Grand Prize	.15	.20	.10	.15	....	....	....	.10
Gould & Curry	.95	1.10	90	1.00	.55	.75	.50	1.05
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	3.10	3.25	2.85	4.00	2.25	2.85	2.50	2.95
Holmes	3.40	3.50	....	....	3.50	3.75	....	3.70
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	....	.15	....	.15	....	.10	....	.15
Martin White	....	.40	....	....	....	....	....	....
Mono	1.10	1.55	1.30	1.55	1.30	1.50	.05	1.35
Mexican	.90	1.00	.65	1.00	.55	.70	.45	.60
Mt. Diablo	3.50	3.80	3.50	3.75	....	3.50	....	....
Northern Belle	....	....	....	....	....	....	....	....
Navajo	3.75	3.80	3.75	3.95	3.00	3.55	3.20	3.25
North Belle Isle	....	.45	....	.45	.40	.40	.35	.40
Occidental	....	....	1.25	1.50	1.00	1.15	....	1.25
Ophir	.75	1.00	.60	.85	.50	.60	.50	.55
Overman	.15	.20	....	....	....	.10	....	....
Potosi	1.00	1.15	.90	1.15	.65	.95	.75	.90
Final Con	....	....	....	....	....	....	....	....
Savage	1.25	1.35	.95	1.45	.65	.90	.75	.85
Seg. Belcher	....	....	....	....	....	.60	....	....
Sierra Nevada	.80	1.00	.60	1.00	.45	.65	.45	.90
Silver Hill	....	....	....	....	....	....	....	....
Silver King	....	4.05	....	1.13	4.75	5.00	....	5.25
Scorpion	....	.15	....	.45	....	.10	....	.10
Syndicate	.50	.55	.45	.55	....	.45	....	....
Tioga	....	....	....	....	....	....	....	....
Union Con	.75	.90	.55	.90	.45	.65	.45	.50
Utah	.55	.60	.45	.50	.30	.40	....	.30
Yellow Jacket	1 60	1 80	1.50	1.75	.90	1.50	1.15	1.20
....	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Nov. 27.		AFTERNOON SESSION.	
1900	Alta .35c	1000	Alta .3c
100	Andes .25c	100	Alpha .85c
450	Bodie Con .2.60@2.65	200	Bodie .2.50@2.60
200	B. & Belcher .1.10@1.15	150	B. & Belcher .1.00
115	Con Va & Cal .10c	100	Belcher .65c
610	Chollar .1.80	200	Bullion .15c
200	Con. Pacific .95c	50	Con Va & Cal .15c
100	Consolidated .60c	20	Chollar .1.70
100	Exchequer .15c	100	Gould & Curry .1.00
850	Gould & Curry .1.10@1.15	200	Grand Prize .05c
920	Hale & Nor .2.95@3.00	500	Hale & Nor .2.80
250	Mexican .55c	190	Mexican .45c
150	Mono .75c	330	Mono .65c
400	Potosi .90c	50	Mt. Diablo .3.75
500	Solid Silver .15c	500	Navajo .3.25
250	Scorpion .15c	200	Ophir .50c
570	Sierra Nevada .1.05@1.10	200	Overman .10c
500	Savage .85c	100	Potosi .80c
500	Union .55c	240	Sierra Nevada .95c
30	Utah .80c	330	Savage .95c
50	Yellow Jacket .1.10	300	Union Con .45c
		70	Utah .70c

Mining Books.

Orders for Mining and Scientific Books in general will be supplied through this offices at pub lished rates.

San Francisco Metal Market.

[WHOLESALE.]

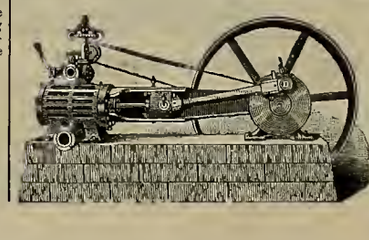
THURSDAY, Nov. 27, 1884.

ANTIMONY—Per pound	-	@ —
Hallet's	13	@ —
Cookson's	14	@ —
BORAX—Refined	7½	@ 8
IRON—Glengarnock ton	25 00	@ —
Eglinton, ton	24 00	@ —
American Soft, ton	27 00	@ —
Oregon Pig, ton	—	@ —
Clipper Cap, Nos. 1 to 4	30 00	@32 50
Clay Lane White	22 00	@ —
Shotts, No. 1	26 00	@ —
Refined Bar	3	@ 5½
Boiler, 1 to 4	5 00	@ 5 50
Plate, 5 to 10	4½	@ 4¾
Nail Rod	7	@ —
Norway, according to thickness	6	@ 7
STEEL—English, ℔	15	@ 25
Black Diamond, ordinary sizes	13	@ —
Drill	15	@ —
Machinery	12	@ 14
COPPER—Ingot	14	@ 15
Braziers' sizes		@ 37
Fire-box sheets	28	@ —
Bolt	23	@ 25
Bar	—	@ —
Cement, 100 fine	12	@ —
Copper in New York, Nov. 27	12¾	@ —
LEAD—Pig	3¾	@ 4
Bar	5¼	@ —
Pipe	7	@ —
Sheet	8	@ —
Shot, discount 10% on 500 bags: Drop, ℔ bag	1 85	@ —
Buck, ℔ bag	2 05	@ —
Chilled, do	2 25	@ —
TINPLATE—Alacastle	5 25	@ 6 00
Charcoal	5 25	@ 6 75
Coke	5 25	@ 6 50
Roofing	6 25	@13 00
ZINC—German	9	@ 10
Sheet, 7x3 ft, 7 to 10 ℔, less the cask	9	@ 10
QUICKSILVER—By the flask	35 00	@ —
Flasks, new	1 05	@ —
Flasks, old	85	@ —

USEFUL HOLIDAY PRESENTS FOR YOUNG AND OLD may be found at Muller's Optical Depot, 135 Montgomery St., near Bush, opposite the Occidental Hotel, San Francisco, as follows: Elegant Mercurial Barometers for Offices, Halls, Libraries, Hotels, Vessels, etc. Pocket Altitude Barometers for Mining Engineers. A full line of elegant Thermometers, Mining Compasses, Microscopes for Boys, from $1.00 to $10.00—something more costly and suitable for a Doctor's Office, both useful and ornamental. Opera, Field and Marine Glasses, Drawing Sets, Fine Gold Pebble Spectacles and Eye Glasses expressly made for the Holidays. Great pains taken in selecting Spectacles or Eye Glasses to be sent away for Christmas.

C. MULLER, Leading Optician, 135 Montgomery St., near Bush, opp. Occidental. x

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.



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STATIONARY and PORTABLE BOILERS,
And Heavy Saw-mill Machinery.
....SOLE AGENTS FOR THE....
Skinner & Wood Portable Engines and Boiler

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

(From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.)

FOR WEEK ENDING NOVEMBER 18, 1884.

308,047.—FRUIT DRIER—J. Bachelder, Napa, Cal.

308,129.—CONVERTING MOTION—M. P. Bullum, Dunnigan, Cal.

308,134.—MITERING MACHINE—Paul Cashin, S. F.

308,135.—THRASHING TEETH BLANK—John Christian, San Jose, Cal.

308,136.—THRASHING TOOTH—John Christian, San Jose, Cal.

308,140.—FIRE KINDLER—B. W. Connolly, S. F.

308,141.—COPY BOOK—E. P. Connor, Alameda, Cal.

308,148.—FRUIT PICKER—H. W. Folson, S. F.

308,153.—APPARATUS FOR CUTTING CHANNELS IN WATER WAYS—John Gates, Portland, Or.

308,156.—DUST COVER FOR DRAWERS—A. J. Hamilton, Beaverton, Or.

308,178.—FIRE KINDLER—C. Leduc, S. F.

308,080.—WATER ELEVATOR—Lobb & Strader, Hanford, Cal.

308,189.—DEVULCANIZING AND RESTORING VULCANIZED RUBBER.—J. J. Montgomery, Fruitland, Cal.

308,201.—PIANO ACTION—J. Rudolf, S. F.

308,205.—WINDMILL—Chas. S. Sellers, Brentwood, Cal.

308,211.—SHIP'S DRAG—F. Steinke, S. F.

308,334.—LADDER—E. P. Wright, Portland, Or.

308,159.—TREE AND VINE PROTECTOR—E. D. Hill, Capell Valley, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

DIRT SCRAPER.—Henry O. Hooper, assignor to R. E. Hooper, S. F. No. 309,856. This dirt scraper is so constructed as to be easily and conveniently operated. The load is scraped into a sort of bowl, which is then by a lever brought to a horizontal position with its load. By suitable mechanism, when at the dumping place the bowl is inverted and the load thrown out.

PISTON PACKING.—Arthur H. Barendt and Chas. W. Carter, S. F. No. 307,831. Dated Nov. 11, 1884. This packing for reciprocating pistons consists of rings fitted into the piston head, and, in connection therewith, of a peculiar spring whereby the edges of the rings are held in close contact with the faces of the head and follower, so as to prevent the leakage of steam into and through the space beneath the rings and from one end of the cylinder to the other.

BORING MACHINE.—Giles A. Jackson, Oakland. No. 307,550. Dated November 4, 1884. The object of this boring machine is to properly and rapidly prepare a number of holes suitably separated on a piece of work, such, for example, as in the blind-style of a window shutter for the reception of the end journals of the movable slats. It consists of a series of parallel boring bits adapted to be adjusted to or from each other; on the mechanism for driving them; on a peculiar sliding table adapted to receive and feed the work to the bits; on a series of rollers for discharging the work when completed, and in details of construction.

CARTRIDGE IMPLEMENT.—Jonathan B. Richardson, Mountain View, Santa Clara county. No. 307,870. Dated November 11, 1884. This combination tool for uncapping, recapping, extracting and ramming a cartridge shell, consists in the construction and arrangement of a swinging shell receiver or holder having a loosely-seated punch or pin, a frame or casting to which the receiver is pivoted, and against which the base of the punch bears, said frame having a notch in its base for extracting, and a peculiar pointed arm for bearing on the head of the shell, and upon a fresh cap therein, and for acting as a rammer.

DOUBLE-HAMMER BELL.—Frank O. Landgrane, S. F. No. 301,860. Dated Nov. 11, 1884. This double-hammer gong or bell is principally useful on street cars where signals must be given to the driver from the rear of the car, or from within. It consists of a single gong or bell suitably supported, and having a pair of hammers arranged to be operated from opposite sides, with returning springs or stops. In street cars which are drawn by single horses, and in some others, it is customary to have the cords run along the sides of the interior of the cars, within easy reach of the passengers, which has necessitated the use of one gong for each cord. These gongs, being one at each side of the driver's platform, cannot be heard so well as when immediately over his head; and the two are of course more expensive than the single one. By having a gong with a double hammer, with a separate cord to each hammer, two inside cords may be used, but only one bell is necessary.

News in Brief

MAINE will send six car-loads of exhibits to the New Orleans Exposition.

STEAMERS at the wharf will act as hotels during the Exposition at New Orleans.

THE ship Lorenzo, from Wilmington, is reported sinking at Victoria.

THE Sunday ordinance against saloons is strictly enforced at Seattle, W. T.

A BOY of 16 and a girl of 15 were married at Santa Ana last week.

THE Truckee sawmills have shut down for the season after an unusually light cut.

ONE county in Australia has this year paid the bounty on 25,840 dozen of captured sparrows' eggs.

THE Republicans of Washington Territory concede the election of Voorhees as Delegate to Congress.

VICTORIA, B. C., is building a fine opera house, and wants to make an $80,000 contract to sewer the city.

POMONA boasts that its new bank will be finished in January, and seven other business houses are projected.

J. W. ALLEN, of Eola, Or., while trying to shoot a cat the other day shot himself in the knee-joint.

THE Summit Ice Company at Truckee is preparing for work. Four inches of ice has formed already.

THE Waltham Watch Company at Boston has given notice that a large reduction will be made in both the force and wages.

THE Piutes and Washoes have settled their difficulties amicably, and the war of extermination between the two tribes is avoided.

THE Illinois Supreme Court has affirmed the validity of the Chicago ordinance, imposing upon distillers a license fee of $500 per year.

THE bread now baked at Naples is of precisely the same shape as the loaves found at Pompeii that were put in the oven 2,000 years ago.

MARYLAND has shipped to the New Orleans Exposition eight carloads of exhibits, including 4000 pieces of native woods and 200 specimens of stone.

THE Oregon Short Line announces that it will commence running through trains between Portland and Omaha without change of cars on December 1st.

MANY of the most experienced mail agents at Portland think of entering the express service which is to be increased between that city and St. Paul. The uneasiness which attaches to a position in the post-office, is the cause of this proposed action.

Mining Share Market.

Prices of mining stocks still continue low as our table of prices indicate. Yet there is perhaps more firmness apparent than for sometime past. At the north end of the Comstock all work in progress is being pushed as rapidly as possible. At the 3300 station of the deep winze the diamond drill hole to the northwest has been completed, and the drill is now being run to the southwest. A considerable amount of water was found in the northwest drift, notwithstanding that the rock was very hard. The drillings showed that there was but little quartz in that direction.

The north drift on the 3000 level of the Sierra Nevada mine is being run along the east side of the vein and is in material that yields low assays. The best part of the vein lies to the west, and there is hope of finding paying ore when crosscuts are made in that direction.

At Gold Hill work has been resumed in the mines that were for a few days shut down for repairs and full crews of men will soon be working at all points.

At the Alta and Benton mines they appear to be draining the whole surrounding country. At the Yellow Jacket, Crown Point and Belcher lower levels, the water that has so long flooded them has been lowered about 300 feet; the Justice was drained some time ago, and the Silver Hill water has been lowered about 250 feet. They are now running the pumps at the rate of seven strokes a minute and are also running both bailing tanks, yet the water is gaining on them.

Bullion Shipments.

Hanauer, Nov. 18, $5,600; Crescent, 18, $2,300; Queen of the Hills, 18, $3,600; Horn Silver, 18, $12,000; Ontario, 18, $14,723; Christy, 18, $1,550; Horn Silver, 19, $9,000; Vienna, 19, $4,689; Christy, 19, $1,900; Day, 20, $4,344; Navajo, 19, $14,295; Horn Silver, 20, $15,000; Ontario, 20, $15,664; Hanauer, 20, $4,000; Stormont, 20, $2,970; Queen of the Hills, 20, $3,700; Crescent, 20, $2,350; Idaho ore, 20, $1,450; Hanauer, 22, $4,100; Idaho ore, 22, $1,500; Horn Silver, 21, $9,000; Horn Silver, 22, $6,000; Vienna, 22, $1,500; Christy, 22, $1,700; Hanauer, 23, $4,000; Nevada ore, 23, $1,500; Idaho ore, 23, $1,250; Queen of the Hills, 23, $3,500; Horn Silver, 23, $9,000; Ontario, 23, $18,183; Christy, 23, $1,600; Vienna, 23, $3,170; King, 23, $11,466; Bismark, 23, $8,541; Garfield, 23, $11,466.

Mining and Scientific Press.

LEADING MINING JOURNAL OF THE WORLD.

Established in 1860, this Journal has been eminently successful as a popular and useful mining and mechanical journal. Relative to precious metals especially, it is the leading mining paper of the world.

It is largely patronized by the leading Miners, Mine Owners, Superintendents, Engineers, Metallurgists, Chemists, Manufacturers, Mechanics, Scientific, Professional and Industrial "Men of Progress" on the Pacific Coast, and many leading Mining Men throughout the mining fields of the world.

It is by far the best advertising medium in the Pacific States and Territories for Mining, Mechanical, Engineering, Building and Manufacturing Tools and Implements Goods, Supplies, etc.

Being thoroughly able and reliable in its editorial and business management, and long established in the most progressive industrial portion of the Union, at present, its power as an advertising medium is unsurpassed.

Subscription, $3 a year. Advertising rates, moderate. Send for samples and further information.

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BY GUIDO KUSTEL,

MINING ENGINEER AND METALLURGIST.

CONCENTRATION OF OPES (of all kinds), including the Chlorination Process for Gold-bearing Sulphurets, Arsenurets, and Gold and Silver Ores generally, with 120 Lithographic Diagrams. 1867.

This work is unequaled by any other published embracing the subjects treated. Its authority is highly esteemed and regarded by its readers; containing, as it does, much essential information to the Miner, Millman, Metallurgist, and other professional workers in ores and minerals, which cannot be found elsewhere in print. It also abounds throughout with facts and instructions rendered valuable by being clearly rendered together and in simple order. It contains 120 diagrams, illustrating machinery, etc., which alone are of the greatest value. PRICE, $7.50.

ROASTING OF GOLD AND SILVER ORES (Second Edition) and the Extraction of their Respective Metals without Quicksilver. 1880.

This rare book on the treatment of gold and silver ore, without quicksilver, is liberally illustrated and crammed full of facts. It gives short and concise descriptions of various processes and apparatus employed in this country and in Europe, and the why and wherefore. It contains 156 pages, embracing illustrations of furnaces, supplements and working apparatus. It is a work of great merit, by an author whose reputation is unsurpassed in his specialty. PRICE, $3, coin, postage free.

Improved Methods of Engraving.

The production of engravings for ordinary printing is being constantly improved, and the proprietors of this paper, having use for numerous engravings for their own publications are taking special pains to keep up with the progress of the times in all kinds of wood and photo-engraving, and zinc etchings, and now have such connections as enable them to receive orders for all kinds of engravings on the most favorable terms to their patrons, for illustrating books, catalogues, trade circulars, labels, show cards, portraits, views, fruits, vegetables, plants, animals, and scenery for newspapers. Engravings of mechanical inventions, buildings, machinery, manufactories, facsimiles of medals and coins, ancient manuscripts, paintings, drawings, sketches and autograph circulars, views and portraits from nature, medical and scientific objects, antiquities, students', architects', engineers', and surveyors' drawings, etc. Parties interested are invited to write for information desired, stating as fully as possible concerning the illustrations wanted, to this office.

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First street, a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below costs, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. References as to above can be had upon applying to this office.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

ASSESSMENT NOTICE.

Gould and Curry Silver Mining Company.

ASSESSMENT No. 49.

Levied.....October 25, 1884
Delinquent.....November 29, 1884
Day of Sale.....December 22, 1884
Amount.....Fifty cents per share.

ALFRED K. DURBROW, Secretary.

OFFICE—Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

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AIR COMPRESSORS.

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PARKE & LACY, Proprietors,

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DELINQUENT NOTICE.

The Lamphire Gold Mine and Milling Company.

—Location of principal place of business, Room 2, No. 526 Montgomery street, San Francisco, Cal. Location of works, Tuolumne Mining District, Tuolumne county, Cal.

NOTICE.—There are delinquent upon the following described stock, on account of Assessment (No. 1) levied on the third (3d) day of October, 1884, the several amounts set opposite the names of the respective shareholders, as follows:

NAME.	No. Certificate.	No. Shares.	Amount.
Martin, A., Trustee	6	33,320	$3,332 00
Davis, John A.	7	9	90

And in accordance with law and an order of the Board of Directors, made on the third (3d) day of October, 1884, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at the office of the company, Room No. 2, No. 526 Montgomery street, San Francisco, Cal., on Monday the eighth (8th) day of December, 1884, at the hour of 12 o'clock noon, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

ADDISON MARTIN, Secretary.

OFFICE—No. 526 Montgomery St., Room 2, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Bodie Consolidated Mining Co.,

Room 62, Nevada Block, San Francisco, Nov. 20, 1884.

At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 18) of Fifty Cents per share was declared on the capital stock of the Company, payable Friday, December 5, 1884, at the office of Messrs. Laidlaw & Co., New York, only on stock issued from the Transfer Agency in that city, and at the San Francisco office only on stock issued here. Transfer books will close on Saturday, November 29, 1884, at 12 o'clock M.

B. L. BURLING, Ass't Sec'y.

California Inventors

Should consult DEWEY & CO., AMERICAN AND FOREIGN PATENT SOLICITORS, for obtaining Patents and Caveats. Established in 1860. Their long experience as journalists and large practice as Patent attorneys enables them to offer Pacific Coast Inventors far better service than they can obtain elsewhere. Send for free circulars of information. Office of the MINING AND SCIENTIFIC PRESS and PACIFIC RURAL PRESS, No. 252 Market St., S. F. Elevator 12 Front St

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THOMPSON BROTHERS,

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Golden State & Miners Iron Works.

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Golden State Pressure Blowers.

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California Brass Foundry,

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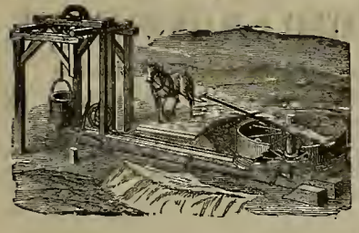
All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rubber Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. ☞PRICES MODERATE.☜

J. H. WEED. V. KINGWELL.

MINERS' HORSE WHIM.



ONE HORSE CAN EASILY HOIST OVER 1,000 LBS. at a depth of 500 feet. The Whim is mainly built of wrought iron. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending the bucket. The standard of the whim is bolted to bed-timbers, thus avoiding all framework. When required, these whims are made in sections to pack on mules.

120 In Actual Use.

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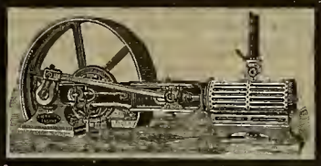

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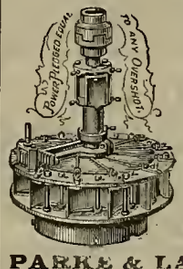

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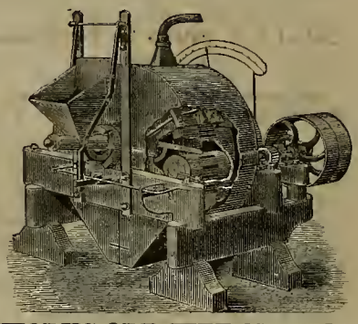

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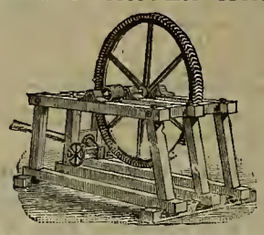

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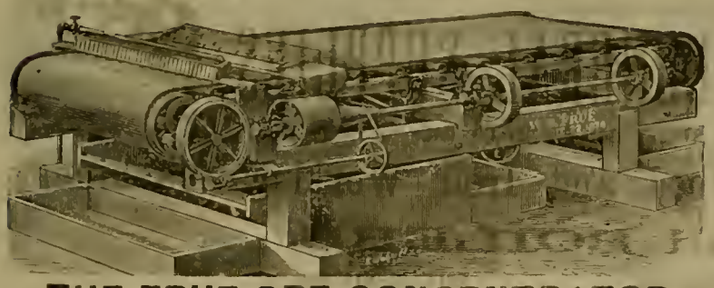

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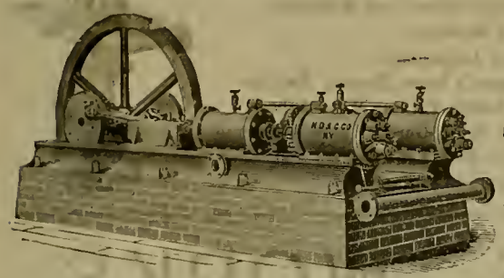

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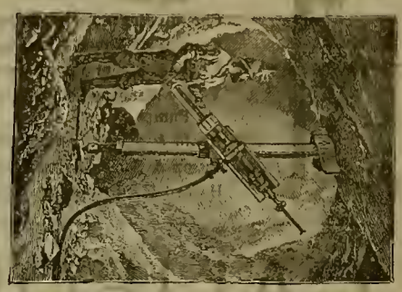

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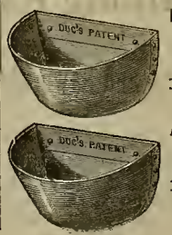

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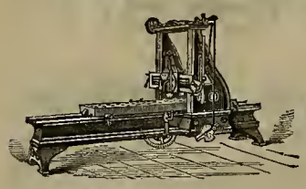

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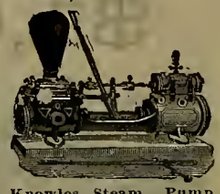

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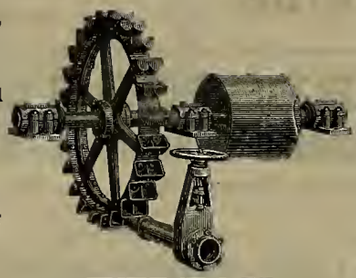

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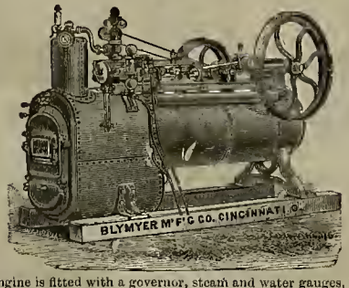

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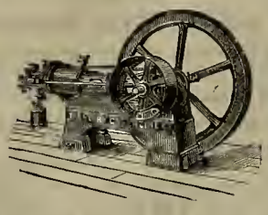

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MINING AND SCIENTIFIC PRESS.

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BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, DECEMBER 6, 1884.

VOLUME XLIX. Number 23.

The Coming Boom.

The New River Mining District.

The boom for the coming spring and summer in all probability will be the above much talked of new district in Trinity county in this State. Of the thousands of fortune-hunters, prospectors and adventurers that will visit this new district next spring and summer, it is probable that a large majority will return disappointed on the same principle that many "forty-niners" the argonauts of old – visited the new El Dorado of the West, returning home disgusted, the realization not meeting their expectations. They had been led to believe from rose-colored and exaggerated stories of the "slathers of gold" to be seen everywhere in California, that all that it was necessary to do was to shovel it into the barrels and kegs with which many came supplied (a fact) and to return by the first steamer to their Eastern homes. A case in point occurred to the writer of this article who was mining July "'49" on Hawkins' Bar, Tuolumne river. The gold on the Bar and in the river was fine and scaly, but in such quantities that the daily result of his labors was one ounce, ($16). A claim at that time that paid less was abandoned. The mining implements used were simply a sheath knife for "crevicing," a pan, pick, shovel and cradle—the latter often costing $75. The miner's bill of fare was a rasher of bacon or pork *a la* frying pan or hot ember roast, frijoles (beans) boiled or baked, venison or bear meat, hoe cake or slap jack, with health, appetite and reputation for sauce. Whisky at $8 per bottle or one pinch of fine gold a drink. The "Barkeep" in those days was not selected for his ruffled shirt and diamond breast pin, but the man that had the broadest digits commanded the highest wages. Well, to my story. While panning out one evening on the bank of the river a long, lank, 6-foot newly arrived emigrant from Pike came to my side and asked to look at the gold. He passed his fingers through it on the pan and asked if that danged little fine stuff was gold. I told him yes, it was my day's work. He burst out crying and said: "I have seen enough, I am going back to Missouri, tomorrow"—and he went.

The New River adventurer, must not, like the Missourian, expect to find a mine opened up and ready for stoping out one hundred dollar ore that he can sell to the capitalist for a fabulous sum, without work and development; but he must go prepared to rough it and undergo hardships. The district is new, extensive and but little prospected. It, however, for the amount of work done gives promise of extraordinary richness. The veins, though small, varying from a few inches to as many feet, rarely pay less than 50 per cent a ton and from that to 200 per cent by actual workings in the arastra. That they hold in depth has been demonstrated by a shaft sunk with the vein to depths of over 100 feet, with well defined walls carrying a clay seam or gouge on the foot wall that often gives results of 100 per cent per ton. Their course on their line of strike is variable, usually, however, with the formation with some easterly and westerly veins cutting the former at right angles. In one instance the writer noticed a vein, the "Hunter," which was traceable by pits and cuts for a distance of 4,500 feet. The average assay taken from the several dumps gave a result of 54 per cent per ton.

The formation in which these veins occur is a feldspathic granite (syenitic), changing gradually to a rock of a trappous character, resembling the greenstone of Grass Valley, Nevada county. In fact, there is quite a similarity in the general appearance and size of the veins. The ores, however, are richer, and so far as developed show no sulphurets, the gold being free, the country rock soft and easily worked. The line of decomposition having probably reached to a considerable depth, in many places extensive slides have taken place. The formation is covered everywhere by subsoil, the ledges rarely crop. The district is heavily timbered and well watered. Altitude above sea level 4,000 feet, and laying exposed to the sun's rays, on the south side of the hill, there can be but little snow lay on the ground during the winter months. For a distance of from four to five miles from the heads of the water-courses where these mines are located the beds of the ravines, flats and forks are virgin, never having been prospected or worked, probably owing to the depth of the soil. They should be rich as New River. From the forks to where it empties into the east fork of the Trinity river has been fabulously rich and is still worked by a few miners.

MAP
Showing
Route to
NEW RIVER MINES
and
MINING DISTRICT.
N
W
E
S
Course to EUREKA
from N.R. Dist. 80 Miles
Course to Enterprise Dist. 20 Miles
Sherwoods
Eagle Creek
Trail
Trail
Trail

CORRESPONDENCE.

We admit, uncensored, opinions of correspondents.—EDS.

White Pine District, Nevada.

[From our Special Correspondent.]

Happily for this coast, stampedes to new mining localities are not so frequent as they once were. Many will remember the rush to White Pine in 1868 and 1869. Nearly the entire Pacific States and Territories were for a time worked up into a perfect furor of wild excitement. Not much wonder; fortunes were made in a day. In many cases as suddenly lost at the gambling tables of Hamilton and Treasure City, or staked as recklessly at the stock boards of San Francisco. Without the aid of hoisting works or other costly machinery, millions were soon unearthed within a few feet from the surface. In a district eight miles by six, several towns quickly sprang into existence. Hotels, saloons without number, banks, business houses, newspapers and like accompaniments, as rapidly followed to supply the wants or gratify the tastes of the eager, bustling crowds flocking into the camps in all ways and from all quarters. In a very short time the population swelled to the number of 35,000.

The South Aurora and the Eberhardt.

Two of the most famous mines at that day, are said to have yielded not less than $10,000,000. One ore chamber of 750 tons of the Eberhardt averaged more than $2,000 per ton, with a gross product of one and a half millions in silver. The entire bullion shipment from White Pine district to date, inclusive of base metal, is set down from the best sources here at about $15,000,000, the two mines above named being credited with the largest share of that amount. Such is a brief account of the early history of the camp, by way of introduction to some details in regard to its present condition and prospects.

It is not necessary to more than allude to the long years of weary waiting and hoping that in the meantime intervened, as a much more cheerful feeling seems to prevail the entire community at present, with a very encouraging outlook for the future.

The Eberhardt Company, Limited,

of London, their property consisting of the Eberhardt and North Aurora mines, situated on Treasure Hill, where so much rich ore was found within 200 feet of the surface, the conclusion was very naturally arrived at, that more of the same sort should be reached at a greater depth.

As early as July, 1876, the company commenced a tunnel at Eberhardt, on the southern base of the hill, since which time the work has been continuously driven. The tunnel proper is 6,000 feet in length, reaching a vertical depth of 1,600 feet, the inner terminus being connected with the surface by an incline of 2,100 feet, that passes through the North Aurora ground. From the foot of this incline, a drift has been run west 1,200 feet, intersecting a lode that has been followed north and south a total of 2,000 feet. To sum up in brief, including tunnel, drifts, upraises above tunnel level, winzes below it, the length of the work is put down as fully four miles in the aggregate. A large amount of ground remains to be explored. Although no large deposits of ore have been discovered, several hundred tons of a good milling quality have been encountered—sufficient to demonstrate the fact, that the ores of the Hill extend to a great depth, contrary to the former theory that they were confined to pot-holes or chambers near the surface.

The company are still pushing the work with air-drills, under the prudent management of Mr. F. Drake of Eberhardt, with hopeful prospects, to say the least, of seeing their efforts eventually crowned with success.

Hamilton, the County Seat

of White Pine county, is situated at the north end of Treasure Hill.

There was quite a revival here the past summer in mining matters, owing mainly to the influx of capital from abroad, and the discovery of what promises to be a large and rich ore body, in one of the claims of

The Sweetwater Mining Company.

They have been operating here for the past two seasons with good results, and are understood to be well provided financially, to mine on a large scale, and to the best advantage.

Mr. C. W. Havemeyer, of the Havemeyer Sugar Refinery, of New York, is president of the company, and Mr. Eugene N. Robinson, well known in Wall Street circles, New York, is the largest stockholder and managing director. They have 14 locations, all told, viz., the Sweetwater proper, the Kerr, the Original Hidden Treasure, the Keystone, the Baldy Sam (between the Eberhardt and Aurora South), the Drew, the Stafford, Fisher's Point, Turkey, Baldy Sweet, Mammoth, Hidden Treasure No. 2, the Bruce and the Irene.

The most important work is given at present to

The Stafford and Original Hidden Treasure,

Both noted mines of the district, the latter for its richness in the past, being put down for $1,500,000, the former, for the bonanza which it promises to show up the ensuing winter, if it should hold out in the ratio of recent as well as present indications.

The outlook at any rate is represented to be exceedingly encouraging. It is understood that upwards of $100,000 in silver were taken from the Stafford years ago.

The ledge is reported fully 30 feet wide and the best defined of any in this vicinity, with good foot and hangiug walls and an 8-foot dyke of spar lying next to the foot wall. The ore ranges from $50 to $60 per ton.

The Wheeler tunnel has already been run 900 feet towards the Original Hidden Treasure, and a new contract has been let to drive it 413 feet farther, which will take it through the ground. The ore from this mine runs all the way from $25 to $1000 per ton.

The yield from these two mines to late owners, since the summer of 1883 has amounted to $73,350, the first fruits only of what is believed to be the sign of an abundant harvest by another season.

The rock is a free milling, silver-bearing ore, with a mere trace of gold, and is reduced at the company's 20-stamp mill at Hamilton.

The average yield at this writing is about $360 per ton. A number of bars seen at the office were marked from 920 to 998 fine, and one as high as 999½, coming as near pure silver as they are ever made.

It is the intention of the company to erect leaching works next spring, with a capacity of from 30 to 50 tons per day. By this process it is anticipated that a much larger per cent of silver will be saved, and ores of a much lower grade be worked with a profit. The same parties own the King mine and furnace, and also

The Ward Beecher Consolidated,

Better known perhaps as the Edgar mine, which has produced about 20,000 tons of ore of the average value of $35 per ton, or not far from $700,000. It has been developed to the depth of 300 feet, with from 5,000 to 10,000 tons in sight of free milling chloride ore, estimated to work $80 per ton. The same company, Mr. J. R. Kendall, superintendent, also own the the Manhattan mill of 24 stamps, 16 pans and other usual appliances.

Their water privileges are said to be by far the finest in the district. The mill has been running on tailings for the past six weeks, during which time they have shipped nine bars of bullion, averaging 995 fine, and valued at about $10,000. About 10,000 tons of tailings remain on the ground to be worked, which will give a handsome net profit to the company. In this connection it may be well to state that the Consolidated Treasure, also under the management of Mr. Kendall, and Mr. J. P. Stevens, of New York, president, has reached a depth of 115 feet, with ore of the same grade and character as that of the Edgar.

The Jennie A. and Black Rock.

Mr. F. Cutting, of your city, is president and chief owner, and Mr. J. R. Kendall, managing director at Hamilton. The rock is of the base metal order, averaging 43 per cent in lead and $40 per ton in silver—carrying some gold. The vein is a contact of quartzite and limestone, similar as to ore and formation to the celebrated Richmond mine at Eureka. About 10,000 tons are in sight and the company are now running an adit level to strike the vein on the dip at the depth of 1,000 feet, vertical.

The Silver Chamber

Adjoins the Caroline, from which nearly $50,000 were taken as early as 1870. It is found in good company, although only a small vein from 1 inch to 19 inches in width. The rock is said to be rich. A few men are now extracting ore with the view to ship—thought to bring them $300 per ton.

The Silver Wave, lying immediately south of the original Hidden Treasure—a good locality—is represented to have an immense body of low-grade ore that will average $30 per ton. Its character is principally a free chloride, with some bromide and horn silver, and some of it closely selected has milled up into the thousands.

The Hope Mine,

Now owned by Matthewson & Co., of Hamilton, has been worked more or less for 12 years. During the first three it turned out in the neighborhood of $65,000, when most of the ore in sight was exhausted. The present prospect is represented as exceedingly flattering, the indications pointing strongly to the speedy opening up of another large ore body.

The Chief, belonging to Messrs. Reilly & Gilmer, is located on the north side of Treasure Hill.

It is opened by a tunnel 300 feet in length, and one shaft to depth of 180 feet, showing an 80-foot ledge, that will work, by mill process, up to $35, on an average.

It is thought here, that with good leaching works on the ground, the whole of this large deposit could be made to pay.

The Continental Con., comprising the C. O. D. and the Fay, at present worked on tribute—a base one—works as high as $130 per ton for first class.

The White Pine Belcher owned by A. Jacobson is looking well. One hundred tons shipped to Eureka worked up to $120 per ton.

The Imperial and Oh Joe,

Together with the Reindeer, Congress, Western Central, Maryland, Eureka, Compensation and Good Luck are the property of Hon. Thos. Wren of Eureka.

It is understood that a large amount has been expended in the past in the way of development of these claims. The Imperial and Oh Joe are the only mines of the group at present worked. The greatest depth attained is about 60 feet. The ore is of the smelting order, running from 7 to 10 per cent in copper, about 30 per cent in lead, and averaging $80 per ton in silver. So much for White Pine proper. On the whole, the prospect for lively times looks favorable.

Notes of Ward, Taylor and some other districts of White Pine county are reserved for another letter. A. C. K.

Hamilton, Nevada.

Weighing by Vibrations.

EDITORS PRESS:—In reference to my communication in your issue of October 29th, I find it necessary to say a few words farther. When my friend expressed the opinion that the instructions on page 72 of my book were erroneous, and that the true deviation in the example given was 1½ divisions, instead of ¾, as I have given it, I understood, as a matter of course, that he meant *permanent* deviation, or the distance from zero "at which the pointer would come to rest if allowed to do so," such being the language of the passage criticised. It now appears that he meant what we may call the temporary deviation or the excess of movement on one side of zero. This will always be double the permanent deviation, if both be calculated from the same elements, and will therefore have half the value in terms of the weights used. It matters not which method be employed, and my friend admits that the book is right, while, claiming that his method is also right, which it is when rightly understood.

In order to clear the subject of all ambiguity, I propose the following terms: The range, the swing and the rest. The range is the total movement of the index, counted in divisions of the arc (incorrectly called vernier by some.) Range may extend to each side of zero, and is then written + and −, plus being usually the right-hand side, minus the left, as + 5 − 3. Or range may extend from any division on either side to zero, as +5 − 0, or − 6 + 0. Again, the pointer may move to either side and not return to zero, as +7 +3; that is, the pointer goes to +7 and comes back to +3, or − 7 − 3 on the other side. Range has no value as an indication of the amount of preponderance, but it affords a means of calculating swing and rest.

Swing is the excess of movement to one side or the other of zero, caused by a preponderance of weight on one of the pans; hence a balance in equilibrium may have range, if the beam be set in motion, but can have no swing in the sense which I propose for that term. Swing is equal to range when one extreme of range is zero; it is the difference of the distances from zero when the pointer goes to each side of zero, that is when the signs of the distances are opposite; it is the sum of the distances when the signs are similar, because if the pointer marks +5 and comes back to +3, it would mark +8 − 0, if the beam had impetus enough, or +9 − 1, etc.

Range is a matter of observation only. Swing may be a matter of observation, for if impetus enough be given to the beam to make the pointer move to right and left of zero, a time must come when the gradual decrease of movement will, practically speaking, cause it to touch zero at one extreme, and when that is the case as said above, swing is equal to (identical with) range. But swing may be calculated from observed range at any time when the beam is oscillating, as shown above.

Rest is the distance from zero at which the pointer will stop if allowed to do so. In this sense, a balance in equilibrium can have no rest, though as before remarked, it may have range. Rest is always half of swing. It may be observed by waiting for it, or it may be known in advance by finding swing and dividing that by 2.

Swing, and therefore rest, may be deduced from a single observation of range, but more accurately from the mean of several, thus: note on a piece of paper three (or more) extremes in one direction, and the intervening two (or more) extremes in the other direction, prefixing to each its appropriate sign; take the mean of each, and find swing by adding the means together if the signs are similar, subtracting the lesser from the greater, if the signs are opposite. In the first case the sign of swing will be the same as that of range; in the second, it will be that of the greater quantity. Rest takes the same sign as swing.

Range may be increased whenever desired for convenience, by wafting with the hand a slight current of air against either of the pans, after which the case must be closed, and a few moments allowed to elapse before beginning the observation. Examples: Range (an average) is +8 −3; as the signs are opposite, swing is the difference, = +5; rest is +2½. Again; range is − 8 +3: the signs are opposite and swing is − 5; rests, − 2½. Let range be +7 +2; the signs are similar and swing is the sum, = +9; rest is +4½. If range is +6 − 0, swing is +6, and rest is +3; or if range be − 6 + 0, swing is − 6, rest − 3.

The value of swing or rest for the balance in use may be found by trial with a known preponderance of weight on either pan. It varies slightly with the load in the pans. Whether the preponderance of weight indicated by swing or rest must be added to or subtracted from the weights in the weight-pan must be left to the common sense of the workman, since it depends upon which pan contains the object to be weighed. If, however, the signs are used as here suggested, and the object be on the left-hand pan, and the index of the balance points downward, the value of a + swing or rest must be added, that of − subtracted. C. H. A.

Arizona Mining Interests.

In the opening address at the recent Territorial Fair in Arizona, Dr. W. W. Jones spoke as follows of the mining interests: The mining interests of Arizona, unfairly represented here on account of the difficulty of cost and transportation of samples, merits especial mention. The United Verde copper and silver mines in Yavapai county are the most important in the northern part of the territory. They are producing heavily, and, with reduced cost of transportation to and from the A. & P. railroad, will greatly increase their output and probably be the great mines of the territory. Mohave, following the line of the railroad, is shipping ores both to California and Benson. Her long silent camps resound with the blasts of the miners. The Bisbee copper mines are prosperous and immensely productive. Tombstone is planting her pumps and will soon resume her former productions. The influence of these mines is readily seen in the activity and energy of her population. The mines of Quijotoa, under masterly management, will revive the business of Tucson. Yuma is destined to be a great mining county, already having in operation one of the most successful and best managed mines in the territory, the Clip mine. She has undoubtedly the position for another smelting work, like that at Benson, to be fed by ore coming down the Colorado and via the Southern Pacific Railroad, and from her own districts, rich in gold, silver, copper and lead. Our own county of Maricopa boasts of a gold mine, the Vulture, which is producing about $30,000 a month and probably $12,000 more from old tailings which are concentrated and the profit sent to Benson. The Red Rover mine, in the same county, promises to be valuable; with a small outlay it can be made immediately productive and very profitable, and all over our vast mineral domain the busy prospector is breaking the crust on new discoveries. The influence of mining properties under way and paying, of all other industries of the territory, is throughout Arizona well understood and estimated, but we should extend more aid and encouragement to the prospector.

Discovery of valuable mines is not a thing of the past; it should be a sustained business of the future.

Gist of the Debris Decision.

The recent decisions of the cases of People vs. Gold Run Mining Company and Hobbs vs. Amador and Sacramento Canal Company, has effectually cleared the calendar of our Supreme Court of this class of cases and settled the law so far as our State is concerned, unless a rehearing in these cases should be granted. The opinions in these cases, as published in full in the *Bulletin*, occupy several columns of fine type, but the substance, boiled down, may be expressed in a few sentences. The Court sustains the judgment and decree of Judge Temple to the extent of granting a perpetual injunction restraining the Gold Run Company from discharging or dumping into the North Fork of the American river or any stream tributary thereto, any boulders, cobbles, gravel or sand from the mines; also from causing any such material to flow or to be washed into said river from its said mines or tracts of mineral lands. They reverse that portion of the decree which permitted defendant to apply to the Superior Court to have the decree and restraining order modified or vacated, and set aside on a showing that efficient means had been provided to improve and hold back such tailings. The opinion of the Court is delivered by Justice McKee and concurred in by Justices Myrick, Morrison and Thornton. The minority of the Court, Justices Ross, Sharpstein and McKinstry, dissent on the ground that the decree of Judge Temple should be affirmed in its entirety, thus giving the mines an opportunity to build restraining dams. But the majority says: "The perpetual injunction does not restrain the defendant from conducting its business *in a lawful manner*, and any means adopted to that end are lawful." We suppose this means that it is unlawful to permit the coarse tailings to reach the river or its tributaries, but if the property can be mined without such a result it may be lawfully worked. The Amador and Sacramento Canal Company is also perpetually enjoined.—*Report.*

MILL BURNED.—A dispatch from Winnemucca, Nev., dated Nov. 27th, says: News has just reached here that the Paradise Mining Company's mill, near Spring City, was burned to-day. The fire is supposed to have caught from the smokestack. The mill cost $60,000 and was insured for $20,000. The company have been declaring dividends right along and giving employment to a large number of men. It is feared, owing to the lateness of the season, that the mill cannot be rebuilt this winter. The superintendent, J. V. McCurdy, is now in San Francisco.

MECHANICAL PROGRESS.

Small Bessemer Converters.

Their Capacity for Producing High Steel Power.

An interesting statement has appeared in the *Engineering and Mining Journal*, in relation to the adaptation of small converters, for the production of high grade steel, and steel for special uses. We quote as follows: "An interesting statement concerning the work in the Clapp & Griffith stationary Bessemer converter, at the works of Oliver Brothers & Phillips, of Pittsburg, was made on Thursday, in the course of a discussion at a meeting of the American Society of Mechanical Engineers, by Mr. Robert W. Hunt of Troy, N. Y. The metal made in it is remarkably low in carbon, and possesses the important quality of welding very well, boiler tubes of very good quality having been made of it. In order to test the question to what extent the employment of a cinder tap made it possible to use inferior pig, Mr. Hunt blew a mixture of 50 per cent. of a pig iron, containing 0.9 per cent. of phosphorous, and 50 per cent. of average Western Bessemer pig. The steel made, contained 054 per cent. of phosphorus, 0.0065 per cent. of silicon, 0.08 per cent. of sulphur, and 0.12 per cent. of carbon. It worked well, and bent cold double. Cast into a 7-inch ingot, rolled into a billet, and then into a half-inch rod, a test showed a tensile strength of 71,000 pounds, an elastic limit of 62,000, an elongation of 25.25 per cent., and a reduction of area of 48 per cent. Five more tests were made, the results of which have not yet come to hand. One test, however, was made from a sprue from the bottom of an ingot rolled to a half-inch rod, and yielded a tensile strength of 78,000 pounds, and an elongation of 28 per cent., results that are justly regarded as astonishing.

These results confirm the good accounts that come from Europe in regard to the use of small converters for special work. It is, of course, well known that for decades, fixed converters have been in use in Sweden, to make a high quality of metal; but they labored under the drawback, that blowing had to be continued until the steel was ready for tapping. The Clapp & Griffith converter, is so arranged, that the tuyeres can be practically closed by plugs at the end of the blow. The blowing engine required, is comparatively small, one English works using only 4 to 4.5 pounds pressure of blast. In South Wales and in Leeds, Clapp & Griffith converters have been running for upward of a year without interruption, the product being used for sheets and for screws. Very soft steel running from 0.03 to 0 04 per cent. of carbon, is aimed at, the recarbonizing being accomplished with from 5 to 6 per cent. of 70 per cent. ferromanganese. The capacity of the converter is comparatively great, from 1 to 1.5 ton charges requiring from 28 to 29 minutes, so that on an average from 12 to 15 blows can be made in an eight hour shift. The repairs of the bottom, which consist of square tuyere blocks, appear to be light, the bottom being changed once a week.

The building in this country of a number of 4 and 5-ton converters during the past few years, for the manufacture of steel for special purposes, such as nails, plates, etc., is sufficient evidence of the drift of opinion among metallurgists. At one time the claim was made in behalf of those who favored the open-hearth furnace, that it was impossible to make in the converter a sufficiently uniform product; that is, to turn out in successive blows a metal that is substantially equally low in carbon, silicon and manganese. The accumulated evidence of the past year, not only concerning the work of small, but also that of large converters, has disposed of this objection.

The introduction of the Clapp & Griffith converter, marks a further step in the same direction. The cheapness of the plant, and its smaller capacity, places the Bessemer process within the reach of even smaller works. It is, of course, especially adapted to the requirements of the tin plate works in Wales, where it has had its first successes; but in this country, it will find a wide field for a variety of other purposes for which the puddling furnace has thus far held hardly disputed sway.

The Iron and Steel Industries.

The English correspondent of *Iron and Steel* says: "Nothing shows more convincingly the supplanting of iron by steel that is steadily going on than the relinquishment of the manufacture of iron by old firms of established reputation, and the introduction of steel-producing plants into their works. A notable instance has just been made public. In 1825 the New British Iron Company was established, and its works opened at Corngreaves, near Dudley, in Staffordshire. For more than half a century the company has been famous for the production of best Staffordshire iron, known far and wide as the "Lion" brand. The directors have now announced that they have laid down plant for the production of steel by the Siemens process, and they say that the calculations they have made convince them that the cost of big-class steel will be little, if any, higher than their "Lion" iron. They propose to call their steel "Corngreaves." This company is the first of the great Staffordshire companies to commence the manufacture of steel; others roll steel, but produce only iron; but, although they still do a steady trade in the world-famed iron, the time must come even when the Earl of Dudley, the king of Staffordshire ironmasters, will have to practically acknowledge that the age of steel has become mighty upon earth, and to bow beneath its sway."

Some reflections are here indulged in by the correspondent, lest the investments in new steel works in England may be going on too rapidly, and especially to the early detriment of the smaller firms.

Some experiments at the Steel Ingot Works, Bilston, in Staffordshire, are detailed as follows: "In the course of some experiments, a plate 26 feet in length by 3½ feet wide by ¾ inch thick, was rolled from an ingot of steel in the short space of 3½ minutes. It is said, by some competent authorities, that the steel plates produced by the basic process have the serious drawback of not welding well, but for ship building and girder purposes the process is heartily approved. The price of good sheet girder plates is now 86 per ton, against 88 for iron plates, the production of steel being cheaper than that of iron."

Improvements in Coking.

Sir J. W. Pease, M. P., who distributed the prizes to the successful students at the Esh collieries, spoke of the improvements in the manufacture of coke by the Simon-Carves process as follows: "Great steps have, within recent years, been made in scientific researches, and in nothing is this more apparent than in the science of coke manufacture. When he compared the ovens that were put up ten or twelve years ago with those of the present day, the contrast was most striking. Some ovens had been put up in connection with his own company on the Simon-Carves process, and they had proved a very great success. There was scarcely any waste going on at all now during the process of manufacture, and he looked back at the past and thought of the thousands, nay millions of pounds, that had been wasted and blown into the air by the old process during the last twenty or thirty years, and which might have been saved had they possessed a little more scientific knowledge.

SOME POINTS ABOUT THE GASKET.—The gasket is a lead casting used on man-heads and hand-hole heads for boilers, to insure a tight, close fit. It is cast in sand or molds, from soft metal; rarely in wooden molds, as the hot metal burns these out and increases the size of the casting. When cast in molds, the latter are kept warm, to prevent the metal from chilling, as this would entirely destroy the value of the casting.

The "bead" on the gasket, is the little ridge on one side, which, flattening out when the man-head is fitted, is supposed to insure a close joint.

Of late, gaskets with a bead on either side, have been brought out, and are pronounced better, by boiler makers, than those with a single bead, as they pull up more easily, and at the same time make a more nearly perfect fit.

Formerly, before the solid cast gasket came into use, small sizes of lead pipe, such as ¼ and ¾-inch lead pipe, was used on man-head and hand-hole heads by boiler makers.

The best gaskets are said to be those cast in sand, and always from the very softest of pig lead. In addition, it is likely that the gasket with a double bead is preferable to that with a single bead.

A LIGHT WEIGHT BUT POWERFUL ENGINE.—An English firm have recently completed a small light compound engine, which in point of weight eclipses any heretofore built. This engine is made of steel and phosphor-bronze; all parts are built as light as possible, the rods and shafting and all parts possible being bored out to reduce weight. At a speed of only 300 revolutions a minute they indicate over 20 horse-power, and weigh but 105 pounds all told. The engine would give fully 30-horse-power actual at a piston speed of 500 feet a minute. The size is three and three quarters high pressure, seven and a half low pressure, and five stroke. That 30 horse power can be had from the proper utilization of steam and proper distribution of 105 pounds of metal is certainly most astonishing, especially so, considering that the engine is compound.

EXHAUST STEAM ON LOCOMOTIVES.—The attempt to utilize exhaust steam on several Boston & Albany locomotives, by the use of double cylinders, has proved a failure, and the company have therefore ordered the removal of the extra cylinder. No. 100, a large locomotive, which has been run on the Boston end of the line, is now undergoing the change in this city, and others will soon receive a similar alteration. It was thought that if waste steam could be utilized the engine would use less fuel.

DRYING WOOD IN SAND.—An Eastern contemporary says that small pieces of wood, such as are used by joiners and furniture makers, can be readily and effectually dried by being placed in dry sand, and then heated to 100 degrees. By this process the sand acts in the manner of an absorber of the moisture, as well as a diffuser of the heat, and the effect is uniform and complete.

TO INVENTORS.—The Australian colony of Victoria offers a reward of $1,250 for a reaping machine adapted to the use of its farmers, and invites American competition.

SCIENTIFIC PROGRESS.

The Rapidity of Sensation.

To form something approaching an adequate idea of the rapidity of sensation, stick a camhric needle in one of the fingers; the sinewy fibers take the impression through the nerve and the posterior root to the spinal cord and thence to the brain, from which is telegraphed back the command "take the finger away." This mandate travels down the spinal cord to the anterior root, and thence through the motor fibers of the nerve to the muscles, which immediately act, and the finger is as once removed. All this takes place with great rapidity, nevertheless not with the celerity once imagined. The researches of such savants as Helmholtz and others of his day and age have shown with great accuracy the rate of speed with which the nervous fluid travels. Other observers have given a great deal of time and patience to this and kindred questions.

As a result of many deliberations, it was ascertained that the nervous fluid moves at the rate of 971 feet in a second. Now electricity travels with a speed exceeding 1,200,000,000 in a second, and light over 900,000,000. A shooting star moves with a velocity of 200,000 feet in a second, and the earth, in its orbit around the sun, 100,000. A cannon ball has a mean velocity of 1800 in a second; an eagle, 130; a locomotive, 95; and a race-horse, 80. We thus perceive that the nervous fluid has not a remarkable rate of speed; a fact which, among others, serves to indicate its non-identity with electricity.

Rapidity of Thought.

Professor Donders, of Utrecht, has recently been making some interesting experiments in regard to the rapidity of thought, which are also very interesting. By means of two instruments, which he calls the noematachograph and the noematachometer, he promises some interesting and important results. For the present, he writes, that a single idea requires the brain to act .067 of a second for its elaboration. Doubtless the time required is not the same for all brains, and that by means of these instruments we may obtain definite indications relative the mental caliber of our friends. What invaluable instruments they would be for nominating caucuses for vestries, for trustees of colleges, for merchants in want of book-keepers, for manufacturers needing machinists and expert assistance; in short, for all having appointments of any kind to make.

For the eye to receive an impression requires .077 of a second, and for the ear to appreciate a sound, .149 of a second are necessary. The eye, therefore, acts with nearly double the rapidity of the ear.

A Greater than Lake Superior, Probably.

Africa is not the only continent which contains immense lakes unknown to the commercial world until within the last decade. Within the last few days Quebec specials report an important discovery to the north of the sources of the Mississippi river, which include an immense lake, probably larger than Lake Superior. The presence of a large body of water there has long been known; but no adequate conception of its immense extent, or commercial value, has been realized, until the recent return to Quebec of a party of explorers from that distant region.

This body of water has been known as Lake Mistassini. It appears to be an expansion of Rupert's river—just as our well known great chain of lakes is an expansion of the St. Lawrence. The Hudson Bay Company have had an agency there, upward of 100 years, but kept it secret that a lake of such dimensions existed. The trade is carried on at the post of the Hudson Bay Company, by giving the Indians provisions and outfits in exchange for skins and furs. The Indians are friendly, and scarcely know what liquor is. Many have accepted Christian teachings.

F. H. Bignell, who was in command of the expedition above referred to, states that the southwestern extremity of the lake, is reached about 300 miles from Lake St. John—that the general trend of the lake, as far as known, is from southwest to northeast, stretching away from Foam Bay its southwestern extremity, to an unknown distance toward the east. The waters of all that region swarm with fish of all kinds, and the fur-bearing animals are abundant. The climate is agreeable, and suitable for agricultural purposes. It is supposed to be as large as Lake Superior.

HOW IT IS DONE.—A Washington correspondent writes: In the base of the capitol at Washington is a steam plant by which the House, the Senate and the committee rooms are warmed and ventilated, and the gas lighted by electricity. It is altogether a big apparatus, consisting of three immense fans, four engines and eight boilers, with the necessary appliances for regulating the temperature and moisture of the air supplied to the nation's legislators. The instrument which tells whether the air is too moist or too dry is operated by a single human hair. A perfectly dry air is put at 0; saturated air, that is, air carrying all the moisture it will hold, is put at a hundred. A dial, with a hand like that of a clock, represents the different degrees from 0 to 100. The human hair absorbes moisture, and like a rope, it becomes shorter when wet. The difference in length between a hair six inches long when wet and the same hair when dry is made to represent the hundred degrees on the dial, and the hand or pointer moves backward or forward as the moisture in the hair varies. If it becomes too dry, more steam is thrown in; if too moist, less steam is allowed to escape, and thus the atmosphere for the nation's statesmen is regulated and kept at the healthful point, which is about fifty.

LONG DISTANCE TELEPHONING.—Experiments are still being continued in long distance telephoning. The latest report, and perhaps the most remarkable yet attempted has just been accomplished by the engineers of the International Bell Telephone Company, who successfully carried out an experiment by which they were enabled to hold a conversation between St. Petersburg and Bologne, a distance of 2,465 miles. Blake transmitting and Bell receiving instruments were used, and conversation was kept up, notwithstanding a rather high induction. The Russian engineers of this company are so confident of further success that they hope shortly to be able to converse with ease at a distance of 4,665 miles; but to accomplish this astonishing feat they must combine all the conditions favorable for the transmission of telephonic sounds. If it is found possible to hold audible conversation at such extraodinary distances, it is possible that this fact will be speedily improved upon, and we shall be enabled to converse freely between London and New York, and by and by between London and the antipodes.

A PHENOMENAL ATMOSPHERE.—Richard A. Proctor, reports that the total lunar eclipse of October 4, presented to him a very unusual appearance. At the time of greatest obscuration, the moon was barely visible as an ill-defined ring of a sickly green hue, while its ordinary appearance at such times is that of a huge, glowing, coppery-red ball, hung up in the sky. He thinks it probable, that the earth's atmosphere was laden with something which acted as a dense screen to the sun's rays, which are pretty certainly known to be refracted through our atmosphere into the shadow cone, to such a degree as to produce the usual ruddy tinge of the moon when totally eclipsed. He asks whether we are here once more brought face to face with the cause of the persistent haze in the sun's neighborhood, and of the late wonderful sunrises and sunsets.

A NOVEL SEMI-SCIENTIFIC COMMERCIAL ENTERPRISE.—A movement has been inaugurated in London in favor of a British Commercial Geographical Society, the object of which is the diffusion of special information in respect of particular markets. The society will acquire and disseminate special knowledge as to the productions, requirements and physical conditions of various countries and localities. In Germany, similar societies exist, where a subscriber may obtain upon the payment of a comparatively small sum information which might otherwise cost him hundreds of dollars to secure. Our English cousins are taking advantage of every possible circumstance to increase their export trade, and our manufacturers and merchants may gain many valuable hints from the methods followed abroad.

LUMINOUS PLANTS.—Luminous plants have a peculiar charm to the grower and observer. One of the best is Fraxinella or gas plant. It is an old favorite, perfectly hardy, a perennial of the very easiest culture, and should be in every garden. In the calm summer evenings when in bloom, a light applied to the base of the stock will envelop the whole plant in flame. This can be repeated time and again, and it appears with benefit to the ripening seeds. This property was discovered by the daughter of Linnæus. The flowers are white or red, and are very fine.

TEMPERATURE OF THE SOLAR SURFACE.—The power developed by the newly invented sun motor, has established relations between diffusion and energy of solar radiation, which prove that the temperature of the surface of the sun is extremely high. Elaborate experiments have been initiated with this motor, from which important results are expected.

IMPROVED GUNPOWDER.—It appears that the English Government is giving preference in its recent purchases of gunpowder to German manufacturers. The composition is kept a secret by the German manufacturers. Very naturally, the English manufacturers are protesting against the action of their Government.

THE SUN.—According to Professor Young, the central portion of the sun is probably for the most part a mass of heated gases, the photosphere is a shell of luminous clouds, the chromosphere is composed mainly of incondensible gases, and what constitutes the corona is entirely unknown.

FILTERING-STONE is now made by mixing in water in certain portions, clay, levigated chalk, coarse and fine glass, sand and ground flint. They are moulded and hard-burned.

A LARGE MEMBERSHIP.—The last annual report gave the membership of the American Association for the Advancement of Science as 2011.

MINING AND SCIENTIFIC PRESS.

A. T. DEWEY. W. B. EWER.

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W. B. EWER.....SENIOR EDITOR.

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SAN FRANCISCO:

Saturday Morning, Dec 6, 1884.

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Passing Events.

The section attracting most attention of mining men at present is the New River District, in Trinity county, this State, where some very rich gold mines are being found. We give in this number an account of the mines, with a map of the region, showing the routes. We shall give further details shortly.

It is reported that a sort of ancient river channel has been found in Lower California, near the Gulf of California. Considerable money has been taken out, but they have to dry-wash for the gold. That whole region is a dry one, water being scarce everywhere. In fact they have at the new mines to pay 25 cents a bucket for water, so there will be no hydraulicing in that part of the country.

The State Mineralogist's annual report has been issued, and miners may procure it by writing to Mr. Henry G. Hanks, in this city.

In this latitude the weather remains clear and fine, though in many of the mountain regions the cold weather has set in.

IT is becoming more and more probable that copper will soon take the lead as an Arizona mining product. The unprecedentedly low price of the metal at present, added to the enormous freight which has to be paid on coke, have kept the industry in the background so far, but these obstacles will be removed, and Arizona will come to the front as a copper producer.

A Check to Deep Mining.

For a long time explorations have been going on at very great depths on the Comstock, without any remunerative results, though work has been continued with the hope of finally finding something of value. Several companies joined together to work a deep winze at the depth of 3,300 feet in the Mexican, and from that depth diamond drill holes have been run in every direction for about 500 feet, but nothing of any value was found. In case there had been, it would have encouraged all the other companies to prospect at those depths, and great interest has therefore been felt in the prospecting operations at that point. We have chronicled the progress of the work from week to week in our "Mining Summary."

It is stated that on Wednesday evening of this week, at the Union Mining Company's office in this city, meetings were held of the Union Con., Sierra Nevada, Mexican and Ophir Mining Companies, and the Con. California and Virginia, a resolution was passed to abandon for the present, if not finally, all of that portion of the workings below the 2700-foot level of the above named mines. The pumps below the 2700-foot level are driven by compressed air—a very expensive operation. In the Ophir, Sierra Nevada and Union, the depth of explorations has reached the 3100 level, from which point the diamond drill has searched in every point of the compass, and nothing found. It is determined, at present, to fully explore the 2700 level and all the immense stretches of virgin ground above that level.

This will be bad news to the Comstock miners as a matter of course and a matter of discouragement to the owners as well. But after extended time and much expenditure they have come to the resolution referred to. Now they will come up a little and prospect from levels not so deep. There is plenty of ground for them to prospect as it is.

A New Alaskan Volcano.

On the 14th of September, 1884, Capt. Hague, commanding a vessel belonging to the Alaska Com. Co., left the northeast side of the island of Atkha in 52° 17′ north, 174° 05′ west for the harbor on Kagamil Island. Umnak harbor is on the north side of Umnak Island and Unalaska. Her track carried her across the 72 passage (172° longitude west) on the north side of all the islands.

In latitude 52° 45′, longitude 170° west is the southern and largest of the "Islands of the Four mountains." The group lies 30 miles westward from Umnak Island and 135 miles from Volcano Makushin on Unalaska.

The day was beautifully clear with light airs from the northwest, and he had the islands in view for a long time. On the largest island is a high volcano called Kigamilgach, which Capt. Hague thinks is as high as Makushin (5,691 feet). He approached the northwest part of this island very closely, and at 2 o'clock P. M. saw a sudden outburst of dense, black smoke from the summit of the volcano. It was above the stratum of air which was fanning his vessel along, and it rose perpendicularly, high into the sky as a dense, black column apparently 100 fathoms in diameter.

He did not approach the island nearer than 10 miles, and stood around the west and north side of Uhaja island, the northwest one of the group. In 45 minutes the column of black smoke decreased so that the issue was almost exhausted; but the great volumes that had been projected were gradually spreading through the upper atmosphere. Suddenly a second outburst, of the same character as the first took place, and was projected high in the sky. He visited the harbor on the north side of Kagamil island, the northeastern of the group, and then ran for the harbor of Umnak, nearly due east. The sky, especially to leeward, was now very dark, from the amount of ashes in the air, and when he was at the anchorage, about 6 P. M., the ashes covered the vessel with a slight coating. He had the wood work washed down into a basin, and thus collected a small amount of the fine but gritty ashes, of the usual pumice color. After settling, the water was poured off and the residue placed in an evaporating dish and dried. The sky was very darkly overcast by the volcanic smoke and ashes, but he was beyond the possibility of seeing whether the volcano was yet emitting them.

The Navy Yard Dry Dock.

On Saturday last the members of the Technical Society of the Pacific Coast, on invitation of Engineer C. C. Wolcott, visited the stone dry dock now being built at Mare Island Navy Yard. The gentlemen, after being presented to the Commaudant of the Yard, Commodore Russell, who cordially welcomed them, visited the sectional dock, on which was the U. S. S. Adams in course of repair. They also examined the model and drawing of the new dock and visited several of the departments, subsequently partaking of an excellent lunch at Mr. Wolcott's quarters.

Then in company with Mr. Wolcott, Captain McNair, the Captain of the Yard, Commander Glass and others, the party went down into the immense dock. The officers explained all the engineering features, details of construction, etc. The concrete foundation is all completed, and much of the stone work is done. The outer end of the dock, where the caisson fits, is finished and the huge iron caisson now being built in this city, at the Union Iron Works, will be launched next week, and towed up. At present a dam prevents the ingress of the water from the straits.

The granite being used is from California quarries. The blocks are all made and finished accurately at the stone yard on the island, and then put in position by means of the derrick. The work is of the most massive character. The whole stone floor is completed, and they are at work finishing up the sides. At the time of the visit one of the large granite blocks was being placed in position, a proceeding watched with much interest by the entire party.

The new dock is the most elaborate engineering work ever attempted on this coast. It will cost, when completed $2,500,000. It is of a capacity to accommodate the largest ships of war of the greatest depth. Immense centrifugal pumps will be used to empty the dock and the most powerful mechanical appliances will be used throughout. The stone is all laid in cement, on a concrete foundation, and every care has been taken to make the structure the most complete and perfect of its kind in the world.

After the dock had been examined the party went to see some tests made as to the tensile strength of the cement used. Each lot of cement is tested. Small lots are made up and allowed to stand for a specified length of time to harden. Then with a testing machine, the strength is ascertained. So far it has all been very good, only one or two lots having been rejected. The gentlemen during their visit went to the ordnance department, the blacksmith shops, saw the automatic dredger (described elsewhere in this number), and otherwise enjoyed a very pleasant visit, returning to Valleys Junction in time to see the work going on at the new Selby smelting works, before taking the train for home. The officers at the Navy Yard exerted themselves to make the trip in every way a pleasant one, and their efforts were thoroughly appreciated.

Academy of Sciences.

Professor Davidson presided at the meeting of the Academy of Sciences on Monday evening last. Among the donations were the following: C. W. Brooks, five specimens of freestone from Connecticut; W. J. Fisher, three specimens from cliff, Hamishak bay, Alaska; two specimens from Unigot island, Alaska; Dr. H. W. Jemans, lava from near Bogoslov (new eruption); Engineer McLenyan, two specimens of serpentine from Jade mountain, Koomak, Alaska; O. Albert Bernard, volcanic ashes gathered from the deck of the British bark *Ardovas*, August 27, 1883, when she was 700 miles from the volcano; R. H. Stretch, species of California reptiles; Captain C. H. Tierney, a box of fish, water-snakes, and a jar containing hair from the head of a native of the New Hebrides; Captain Hague, one bottle of volcanic ashes.

Professor Davidson made a report of recent observations made by himself on Saturn. Reports had gone forth that the Encke division had disappeared, but during observations last week the Professor saw it on three successive nights.

He also communicated the report of Capt. Hague on the new volcano at Four Islands. This is given elsewhere in this issue of the PRESS.

Professor Davidson also gave the results of some experiments he has been making with glass tubes. It had been stated that a lady, in cleaning lamp chimneys, found they often broke after being cleaned with a brush with a wire handle, and even after being touched with a gold ring. Glass tubes, such as are used for steam boiler gauges, were procured and a small copper wire passed through them repeatedly when they were set aside. They invariably broke in from 6 to 24 hours after the wire had been passed through them, showing it was a mistake to use any metal in cleansing glass.

Dr. Albert Kellogg read a memorial on the late Henry Gibbons, Sr., one of the founders of the Academy of Sciences, and one of its most active members for many years.

New Blasting Compound.

Joshua Robertson, of this city, has recently obtained, through the MINING AND SCIENTIFIC PRESS Patent Agency, two patents on explosive compounds, which he has assigned to Charles W. Randall. The first invention consists in combining anhydrous sodium sulphate—commonly known as "sulphate of soda"—with nitro-glycerine, thus forming an improved explosive compound; and among the advantages possessed by this compound are diminished cost of production, increased tenacity of union between the ingredients, and a material diminution of noxious fumes. A proportion of nitro-glycerine which, in a compound consisting of infusorial or silicious earth and nitro-glycerine, cannot be exploded, can in this compound be readily and certainly detonated, and, being non-deliquescent, it is not readily affected by moisture.

To produce the compound, the inventor places 65 pounds of finely pulverized anhydrous sulphate of soda in a wooden tank or other suitable receptacle, and gradually adds thereto 35 pounds of nitro-glycerine. The mixture is stirred by a wooden rake or other suitable utensil until the nitro-glycerine and sulphate of soda are thoroughly incorporated together, when the compound is ready to be placed into cartridges for use.

The foregoing is an example of the proportion merely, the relative proportions being susceptible of considerable change, in accordance with the desired strength or grade of the explosive. The strength of the explosive may be increased or diminished by increasing or diminishing the proportion of nitro-glycerine, the illustration given being taken as a standard, care being taken not to add sufficient nitro-glycerine to reduce the compound to a soft or pasty consistency. When properly prepared, the explosive is of a granular or pulverulent character.

The manner of firing this explosive is the same as that in common use—by means of a detonator, either with or without a priming-charge.

The anhydrous sulphate is obtained at nominal cost by utilizing the waste product known as "niter cake," resulting from the manufacture of nitric acid, and have found the following process convenient and effective. The required quantity of niter cake is placed in a furnace and subjected to a degree of heat sufficient to expel any remaining free acid, which condition can be determined by the usual tests. The product is then dissolved in hot water and allowed to crystallize. The crystals thus obtained are subjected to a degree of heat sufficient to expel the water of crystallization, (about 95° Fahrenheit,) and then ground to an impalpable powder. In this condition the product is ready for use. This part of the process is not new. From whatever source the anhydrous sulphate of soda is obtained, it is essential that any free acid it may contain shall be expelled or neutralized before combining it with the nitro-glycerine. The other compound we shall describe on another occasion.

BLACK SAND in unlimited quantities is found on the ocean beach near the entrance to Yaquina bay, Or. This sand contains unknown quantities of gold, but of such fineness that all efforts to mine it have as yet proved unsuccessful. It is now learned that a company has been formed to attempt, with improved machinery, the extraction of the gold from this sand.

THE mining companies which have offices in this city paid out $263,250 in dividends last month, against $206,700 in the same month last year.

FROM January 1st to November 12th the Horn Silver mine produced $2,239,000, and the Ontario $1,447,500. Both mines are in Utah.

A New Pressure-Filter.

At a recent meeting of the American Institute of Mining Engineers, R. P. Rothwell of New York, read the following paper:

A year ago I commenced experiments in precipitating and saving gold from chloride solution, in the course of which I found H_2S (made from paraffine and sulphur) the most convenient and inexpensive precipitant. The gold is thrown down as gold sulphide; and a considerable time is required for this precipitate to settle. Even after it appears to have settled, we find by experience that there is a notable loss of gold, if the clear liquor be decanted off in the usual way.

To remedy this evil, I made a small and very cheap pressure filter, which has now been used for nearly nine months, and has given the utmost satisfaction. This filter is constructed as follows:

Three frames, about 4 feet by 2 feet, are made of 2-inch by 3 inch pine. Two of these frames are filled in with ½ inch slats leaving about ½-inch spaces between the slats, as shown in Fig. 1.

These slats are covered with cloth or drugget, and Swedish filter-paper is laid on the top of the cloth. The notches shown in the figure receive bolts of ⅜ or ½-inch iron, to hold the frames together.

The third frame, shown in Fig. 2, is of the same size and thickness as the others, but has, instead of slats, only one cross-bar. When the filter is put together, the third frame is placed between the other two, and the cross-bar serves to press on the joint of the filter-paper and keep the two sheets together. This cross-bar is perforated, to permit the passage of the liquid, which enters through a pipe at the end provided with a faucet, and fills the whole filter.

Fig. 3, shows in perspective the filter complete. It will be seen that the middle frame, keeping the other two apart, furnishes a space between them to be filled with liquor. This is brought through a rubber or iron pipe from the precipitating tank. Since the filter is set on a lower level, any desired head or pressure can be obtained. About five or six feet is generally enough. The liquor passes out through the filter-paper, which collects the gold, through the cloth, which is merely a support for the filter-paper, and then between the slats forming the sides of the filter.

Fig. 4 is an enlarged view of one of the malleable iron castings screwed on the outside frames to receive the bolts. These when loosened a little, may easily be lifted out of the notches, and thus the filter is very quickly opened. Before opening, it is laid on a sheet-iron tray. After the filter has been opened, the gold precipitate is rolled up in the filter-paper, fresh sheets are put in, the frames are again bolted together, and the apparatus is ready for further use.

We strengthen the filter still further by a couple of cross-bars of hard wood, as shown in Fig. 5. This is required by the swelling of the frames, held around their edges by bolts, which tends to loosen the joints of the frames.

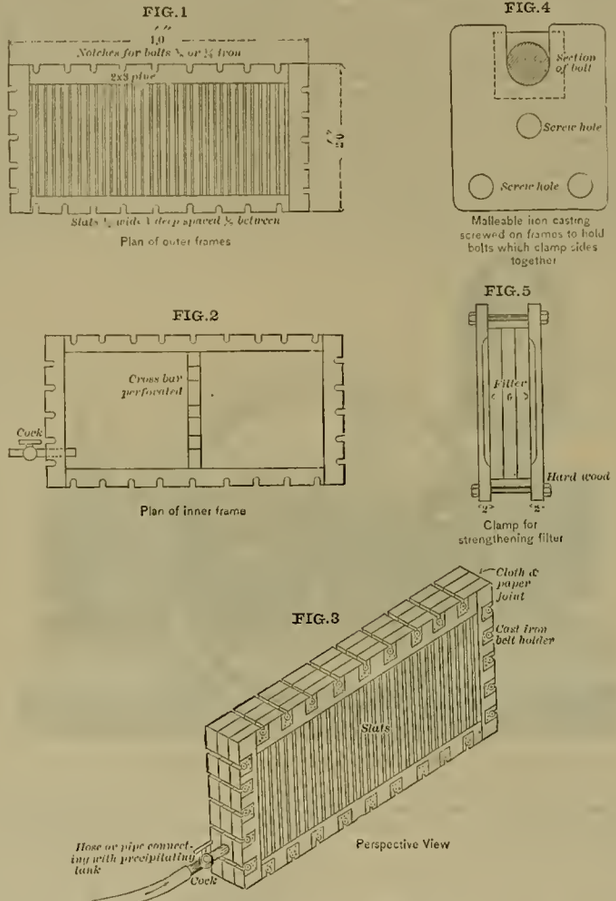
The total cost of the filter will not exceed five dollars. It requires no attendance; the cloth lasts indefinitely (since the liquor is necessarily neutral before the gold will precipitate); and we have still the original cloth of one of our filters. Such a filter, four feet by two feet in size (giving an area of two sheets of filter-paper, and hence containing, on the two sides, four sheets), will filter from fifty to one hundred and fifty gallons per hour, according to the amount of precipitate on the paper. The liquor passes very rapidly through it at first, and more slowly as the precipitate accumulates; but the filtrate is always perfectly clear. When the filtering becomes slow, the faucet is closed, the hose is disconnected, and the chemist and his assistant carry the whole apparatus into the assay-office, where it is laid in a sheet-iron tray, and opened as already described.

No one but the chemist has anything to do with it; and, standing in a closed box, it attracts no attention.

In relation to this, in the discussion, Mr. C. A. Stetefeldt, of New York city, said: "In European works, where solutions with precipitates have to be filtered, the filter-press is now in general use, and there are quite a number of good constructions. I have myself seen those of Dehne and of Johnson. Johnson's are of English construction, and can be bought in New York. No doubt Mr. Rothwell's press is quite an ingenious one, and has been got up for this special purpose at slight expense; but perhaps it would be preferable, where large quantities of solutions have to be filtered, to buy a filter-press of more perfect construction. They are exceedingly convenient, and filter almost anything, leaving the precipitate in the form of a dry cake. In Oker, Germany, they are used, for instance, in Claudet's process. The filter-press has largely taken the place of the centrifugal machine.

An Automatic Dredger.

They have at Mare Island Navy Yard, a dredging apparatus, devised by the engineer, Mr. C. C. Wolcott, which is actuated by the tidal current of Mare Island straits, and which is performing very good work without expense. As the mud had collected along the front of the island, at the wharves, and there was no appropriation for dredging, there was difficulty in getting vessels alongside, especially at the coal wharf, where it had shoaled to eight feet.



ROTHWELL'S IMPROVED PRESSURE-FILTER.

Mr. Wolcott conceived the idea of utilizing the swift tidal current of the locality to operate suitable mechanism to remove the mud, which is here very soft.

He constructed a frame work, suitably braced and having floats at each end. On one end is an undershot wheel, about 18 or 20 feet long, with broad buckets, set at right angles to the direction of the current. This wheel is mounted on a shaft, and has a spur wheel on its inner end which meshes with the gears on two drums or rollers. These drums carry double ropes, and between each pair of ropes, are placed small buckets. At the inner end of the raft, are corresponding loose pulleys or rollers, arranged so as to be submerged and dropped into the mud alongside the wharf. The endless ropes from the outer drums pass around these pulleys.

The current actuates the large water-wheel, which revolves the drums, moving the endless ropes with their buckets, so that the buckets pass down into the mud, are filled and then pass out to the outer end near the wheel. Before reaching their outer position, they meet the swiftly moving current, which washes the mud from them and bears it away to places where it is not in the way.

The tidal currents on Mare Island straits are very swift, more especially for about three hours of the ebb tide, and as there are two ebb tides each day, the best effect is obtained then, although the wheel will revolve at all times, except on the slack waters at changes of tide.

The original cost of this appliance was about $500 and it has performed its functions constantly without cost, deepening the water all along in front of the docks and wharves. It needs slight attention, a man going once a day or so to lower the inner rollers. The position of the raft is changed as occasion demands, anchors and lines being used to hold it in position, at right angles to the current.

When the dredging is finished Mr. Wolcott proposes to utilize the water-wheel to pump water to a high tank, where it can be accumulated for use at any time. It would seem that a device of this character could be utilized at many places along our rivers and water-courses. It has certainly acted very well where it is. It is true that the current is very swift, and the mud soft, and in other places such good effects might not be produced. Yet the wheel works away day and night, requires very little attention, and costs nothing after construction. A stirrer to stir up the mud was used at first, and operated by the same wheel, but this was found unnecessary, and has been dispensed with.

If nothing valuable is found while exploring the 2800, 2900 and 3000 levels of the middle mines of the Comstock, there will be a more general shut-down at the deep shafts, and a falling back upon the ore deposits which are known to lie nearer the surface. On the other hand, a single good find in the lower levels will revive the whole situation, and the water will be quickly drained from other deep mines, and prospecting be resumed in their bottoms.

At a recent meeting of the Board of Regents of the University of California, President Reid moved to create a new professorship of mining and drawing. The matter was referred to a committee consisting of Regents Winans, Swift and Marye. A resolution was adopted calling upon the Representatives of this State in Congress to have an Act passed increasing the agricultural facilities of the University.

The station at the 3000 level of the Combination shaft on the Comstock will soon be completed. The greater part of the machinery of the new hydraulic pump which is to be placed in this station is now on the ground.

New Smelting Works.

A representative of the Press last week visited the site which has been chosen for the new smelting works of the Selby Lead Co., on the bay shore of Contra Costa county, a few hundred yards west of Vallejo Junction, on the Central Pacific Railroad line. The location has deep water, suitable for shipping, for a frontage, and in the immediate rear are the tracks of the Central and Southern Pacific Railroads.

Some 60 or 70 men are engaged in grading, cutting down the high hill and filling in on the flats. The space being now leveled is about 500 by 400 feet, and a wharf will be built along the front. The soft rock will be filled in on the out-side, and in course of time old slag will be placed over that. The largest vessels can be accommodated at the dock. The new works will consist of quite a number of buildings, with complete equipments. The refinery at Seventh and Brannan streets, in this city, is already being torn down, and the North Beach building will be taken down when the new works are completed. The people of Contra Costa are jubilant over the prospective acquisition, and although the works will cost much less than is estimated by popular rumor, the advantages to Contra Costa will still be great. Wooden buildings, with iron roofs, will be used. Much of the old material will be brought up, but all modern appliances are to be gradually brought into requisition.

Concerning the new works, Mr. A. J. Ralston, of the Selby Co., says: "I do not know just when the new works will be completed, but it will be in a few months. The point selected is the first outside of San Francisco where we can get the advantage of deep and safe water at a wharf for vessels with coke, coal, etc., and railroad cars at our doors with ores and other material. The people of the vicinity will not be troubled with fumes, and right back of us is living water all the year round. The place seems to possess all required advantages, and the new works will be much more extensive than those at North Beach."

These works employ about 100 hands the year round. It is generally understood that the scope of the enterprise will be enlarged, so that general metallurgical work can be done, which will be a boon to the miners of this coast, as they now have to ship away much ore that might be worked at home.

Foundry Notes.

The Union Iron Works office, which has been for many years in the old quarters at the corner of First and Mission, has been removed to the corner of Fremont and Market streets. All the tools and material in the old shops have been removed to the new works at the Potrero, near the Pacific Rolling Mills. The new plant is the largest and finest on the coast, and is adapted to carry on the most extensive work of any character, even to iron ship-building, for which they have special facilities. The works have been built in a substantial manner, with all the modern improvements in the way of tools and machinery. As the shops are some distance out, a business office will be maintained in town at the locality indicated above.

Owing to the depression in trade, the managers of the Ætna Iron Works last Saturday notified the mechanics in their employ that it would be necessary to reduce the hours of work, in consequence of which the men in all the departments of the works on Monday last commenced working on three-quarters time, going to work at 8 o'clock, taking an hour at noon, and quitting at 4:30 P. M.

The Risdon Iron Works have about completed the shipment of the new hydraulic pumping machinery for the Combination shaft on the Comstock. This plant of machinery has been made of great strength and in the best manner. The Risdon Works make a specialty of these hydraulic pumps.

The Pacific Rolling Mills now have their steel works in full blast, and are turning out steel in quantities. Most of the steel made is used by local consumers.

The Union Iron Works have completed the large metal caisson which is to be used at the new Mare Island dry-dock. The caisson is a very large and heavy one, and will shortly be launched and towed up to the island.

Quicksilver has gone up to $35 a flask in this market, though there is little doing at these figures.

The Common Law and Riparian Rights.

A few weeks ago we cited the decision of the California Supreme Court that the common law as to riparian rights is still in full force in this State and will probably remain so unless statute ordering other principles into force shall he adopted. A part of our readers are adherents of the common law doctrine, for their interests lie in that direction. Others whose values are vested in irrigation rights are opposed to riparian rights because their interests are in that direction. The question must be argued and ultimately settled in one way or the other unless some compromise can be discovered, which hardly seems practicable at the present time. In order that all who are interested in the discussion may see the grounds upon which the Supreme Court reached their decision, we quote from the opinion by Mr. Justice Sharpstein as follows:

The question whether in this State one can rightfully divert and appropriate to a useful purpose any considerable part of the water flowing in a natural stream over the lands of others, who are making no use of it and deriving no benefit from it, beyond such as it naturally confers by running through their lands, has been elaborately argued by counsel. The contention of the respondent is that, "The doctrine that the owner of land upon the margin of a flowing stream, has the right incident to such ownership, that such stream shall continue to flow unaltered in quality and undiminished in quantity, is a doctrine that was unknown to the common law of England, but on the contrary, the common law was that first in time was first in right as to the uses of the water of a flowing stream, and no action could he except for a disturbance of actual use under an appropriation previously made," and that the law of this State, in this respect, is the same as the common law of England was. But if the common law of England were otherwise, "The so-called doctrine of riparian rights, whereby a proprietor of land bordering upon a running stream is presumed to have a right to the full, free and uninterrupted waters of such stream, is not, and never has been, the law of this State; at least, so far as appertains to State or Government lands, as contradistinguished from those held by Mexican grant."

While it may be difficult and perhaps impossible to define with precision the character and extent of the right which the grantee of a parcel of land acquires in a natural stream of water running over it, all the text writers and all the cases, so far as we are advised, agree that it constitutes a corporeal right or hereditament that passes by grant of the land over which it runs. "For land," says Sir Edward Coke, "comprehendeth in its legal signification, any ground, soil or earth whatsoever, as arable, meadows, pastures, woods, moors, *waters*, marshes, furzes and heath." (1 Inst., 4; 2 Bla. Com., 18; Woolrych Law of Waters, 146; Angell on Watercourses, 8.)

"The right to flowing water is now well settled to be a right incident to property in the land." (Shaw, C. J., in Elliott vs. Fitchburg R. R. Co., 10 Cush., 193.) "But this right or corporeal hereditament, which is embraced within or appertains to the ownership of the land over and through which a watercourse runs, is subject to the same incidents as all other interests in real property. It may be conveyed absolutely, by grant; so, too, it may be lost or acquired, either wholly or in part, by an adverse user sufficently long, exclusive and notorious, to furnish adequate grounds for the presumption of a grant." (Brace vs. Yale, 10 Allen, 441.) So that whatever limitations there may he upon the right, it is well settled that the right itself is incident to property in land. It constitutes a real or corporeal hereditament. It is often said that the owner of land over which a natural stream of water runs has no property in the water itself, but a simple usufruct while it passes along. *Aqua currit et debet currere ut currere solebat* is the language of the law. (3 Kent's Com., 561.) "For water is a movable, wandering thing, and must of necessity continue common by the law of nature; so that I can only have a temporary, transient usufructuary property therein." (2 Bla. Com. 18.) From the context it is quite clear that the learned commentator meant no more than that a natural stream of water must of necessity continue common as between all who own lands through which it runs. Every proprietor of lands on the banks of a river has naturally an equal right to the use of the water which flows in the stream adjacent to his lands, as it was wont to run (*currere solebat*), without diminution or alteration." (3 Kent's Com., 439.) And the same doctrine was laid down in nearly the same words by Sir John Leach in Wright vs. Howard (1 Sim. and Stuart, 190), in which the Vice-Chancellor said: "Every proprietor has an equal right to use the waters which flow in the stream; and consequently no proprietor can have the right to use the water to the prejudice of any other proprietor. Without the consent of the other proprietors, no proprietor can either diminish the quantity of water which would otherwise descend to the proprietors below, nor throw the water back upon the proprietors above."

With the exception of the dicta in a few cases cited by counsel for respondent, we have been unable to discover anything in the text-books or reports which conflicts with this exposition of the common law doctrine on the subject. And in Mason vs. Hill (5 B. and A. 1), Denman, C. J., said: "None of these dicta, when properly understood with reference to the cases in which they were cited, and the original authorities in the Roman law from which the position that water is *publici juris* is deduced, ought to be considered as authorities, that the first occupier or first person who chooses to appropriate a natural stream to a useful purpose, has a title against the owner of the land below, and may deprive him of the benefit of the natural flow of the water."

Has the common law rule in this respect been abrogated or modified in this State?

We know of no case in this State prior to Ferrea vs. Knipe (28 Cal., 340), which involved the question of the right of an owner of land to have a natural stream of water which flowed over it, continue to do so without material obstruction or diminution, from artificial causes. In that case, the Court, "while admitting that a riparian owner to whom the water first comes in its flow, has the right to use it for domestic purposes, and for watering his cattle," said "that he has not the right to so obstruct the stream as to prevent the running of water substantially, as in a state of nature it was accustomed to run." This has never been overruled, or doubted; nor is it in conflict with any of the earlier reported cases.

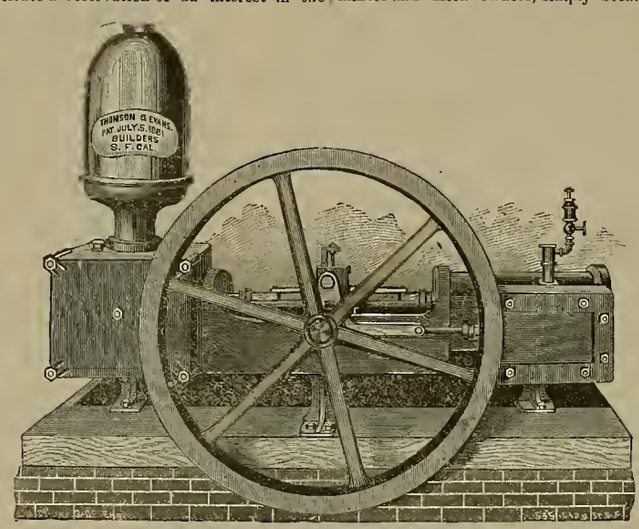
But it is insisted by respondent's counsel that both the United States and this State have adopted a policy in respect of water flowing over their lands, which is inconsistent with the doctrine of riparian rights, as we construe it. As a result of that policy, it is claimed that a grant of land by either of those governments must be read as if it contained a condition, that anyone should thereafter be at liberty to appropriate so much of the water of any natural stream running over such land as the grantee had not previously appropriated to some useful purpose, other than that which it subserved by flowing naturally over such land. That would constitute a reservation of an interest in the land granted, not for the benefit of the grantor, but for that of any other person who might choose to avail himself of it. If a grant does not contain any such express reservation or condition, we ought not to interpolate one unless it is clearly implied. Because the general rule is that the owner of property cannot be divested of any interest in it by the simple prior appropriation of that interest by some one else. Both the State and the United States governments have granted to private persons and corporations large tracts of land which have remained unoccupied and in their virgin state for many years afterwards. It probably never occurred to anyone that the owners, by neglecting to appropriate the grasses and trees naturally growing on such land to some useful purpose, left them open and subject to a rightful appropriation by anyone else. And yet we have the same authority for holding that a simple grant of land conveys a right to have the water flowing over it continue so to flow, as we have for holding that it conveys a right to the trees and grasses growing on it, or to the soil itself. The principle that he who first appropriates property to a useful purpose is entitled to it, applies only to cases in which none of the parties has a grant, actual or presumptive.

In an early case, which involved the question, "whether the owner of a canal in the mineral region of this State, constructed for the purpose of supplying water to miners, has the right to divert the water of a stream from its natural channel as against the claims of those who subsequent to the diversion take up lands along the banks of the stream for the purpose of mining," the land through which the stream ran and through which the canal passed being a part of the public domain to which there was no claim of private proprietorship, the Court held that the common law doctrine which "prescribes that a watercourse must be allowed to flow in its natural channel," could not be invoked in such a case, because, as the Court said, that doctrine would, upon an examination of the authorities which support it, "he found to rest upon the fact of the individual rights of landed proprietors upon the stream, the principle being both at the civil and common law that the owner of lands on the bank of a watercourse, owns to the middle of the stream, and has the right in virtue of his proprietorship to the use of the water in its pure and natural condition." (Irwin vs. Phillips, 5 Cal., 140.)

In Crandall vs. Woods (8 Cal., 136), where both parties had possessory rights in separate parcels of land, the title to which was in the United States, it was held that each had a right to have a stream of water which naturally flowed over both parcels, continue to flow over the parcel in his possession substantially as it did when his possesory right first attached to it. As between themselves, their respective rights in the stream were held to be those of riparian owners.

In Hill vs. Smith (27 Cal., 476), it is explicitly denied that the rules of the common law touching water rights have been materially modified in this State, although in that case it is said that these rules do not apply to sections of the State in which water is exclusively used for mining purposes. But this was said in a case in which neither of the parties owned any land over which a natural stream of water flowed. The respective rights of prior and subsequent appropriators were alone involved. It is claimed that the same reason exists for not applying the common law doctrine of riparian rights to the agricultural, as is given for not applying to the mining regions of the State—because water is as essential to the prosecution of the one industry as of the other in this State.

But in Hill vs. Smith, the Court says: "When the law declares that a riparian proprietor is entitled to have the water of a stream flow in its natural channel—*ubi currere solebat*—without diminution or alteration, it does so because its flow imparts fertility to his land, and because water in its pure state is indispensable for domestic uses. But this rule is not applicable to miners and ditch owners, simply because the conditions upon which it is founded do not exist in their case." The conditions upon which it is said the rule is founded, do exist in agricultural districts. And it is the rule applicable to those districts which concerns us in this case. And after carefully examining all the cases bearing on this question, we are unable to find one in which it is held or even suggested that outside of the mining districts the common law doctrine of riparian rights does not apply with the same force and effect in this State as elsewhere.



CRANK AND FLY-WHEEL STEAM PUMP—THOMSON & EVANS.

THE WHITE PLAINS WELL.—William M. Smith, of the Desert Crystal Salt Works, at White Plains, arrived in town yesterday. He says the artesian well which is being sunk by the C. P. R. R. Co. at that place has attained a depth of 2,100 feet, and is now in solid rock. Much difficulty has been experienced in boring in consequence of gravel, and loose earth resembling ashes, encountered at a great depth. The pipe originally used in the well was six inches in diameter, but it proved impossible to make it water-tight, and several car-loads of heavy four-inch pipe was brought from the East and put in the well. The pipe is now laid to the bottom—2,100 feet—and as the rock at that depth is solid, it is hoped no further difficulty will be experienced from the caving and washing of the ground. The re-piping of the well necessitated a suspension of boring operations, but sinking has again been resumed, and Superintendent Chapin, of the works, who has had much experience in well boring in Pennsylvania, is hopeful of finding fresh water eventually.—*Silver State.*

"SHOULD BE LARGELY PATRONIZED."—The MINING AND SCIENTIFIC PRESS is the leading mining and scientific publication of the West and should be largely patronized everywhere.—*Idaho Keystone.*

THERE are 25,000,000 to 30,000,000 hats made annually in this country, and when a man is the last to leave a banquet he generally gets the worst one.

Irrigating and Mining Pumps.

The accompanying engraving shows one of Thomson and Evans' crank and fly wheel steam pumps, which have taken first premiums at the Mechanics' and State fairs of 1883 and 1884.

These pumps possess the great desideratum that they are simple in construction, easy of examination and adjustment, and are ready for pumping when steam is turned on. These pumps have been submitted to many practical tests, and have always come out ahead. They possess the advantage over other so-called direct acting steam pumps, in having but one valve, and that a plain side valve moved by an eccentric, the same as an ordinary steam engine. Such, if anything should happen, can be seen at once, and he easily fixed by an ordinary engineer or mechanic.

The crank movements of these pumps also insures a full and even stroke, permitting the pump to he run at fast speed without danger of striking the heads. The fly wheel gives a smooth and regular movement, and allows the steam to be used expansively, thus saving fuel. These pumps can likewise be used as steam engines for other work, by means of a belt which can be put on the fly wheel or on a pulley on the shaft, and thus drive any light machinery at the same time that they are pumping. This fact makes the Thomson & Evans' pumps in demand among mechanics, canners, farmers, wine makers, dairymen and others.

Another field in which the Thomson & Evans' pumps have achieved success, is on deep well pumps, for artesian wells, mines, etc. One great feature in these pumps, is that they have a double acting pump constructed so that it can be lowered into an artesian well or mine to any depth, and worked direct from the surface. In this double acting pump, the same amount of water is taken into the pump, raised to the surface and discharged on both the up and the down stroke. They are also provided with a peculiar metallic combination packing for the piston, which resists wear and lasts for years without renewal.

These pumps are specially distinguished for their durability, economy, ease and certainty of action. The manufacturers invite an examination of the pumps, or they will gladly refer to persons who have purchased and are now using them. They are now building one of these pumps for the Government to go to Indiana. Further particulars can be obtained at the foundry, 110 and 112 Beale street, San Francisco.

A Lucky Find.

A very rich strike was made in the Keyes mine last night by the shift that goes on at 11 o'clock, in the drift that is being run to the west, which is now out about four feet from the shaft. A vein eight inches in width carrying black sulphurets was struck, from which nearly a ton of ore assaying $3,000 per ton was extracted during the remaining portion of the shift. Colonel Keyes brought a sack of the ore to the *Chronicle* office this morning in which native silver was plainly visible to the naked eye. For five years Colonel Keyes has been struggling against terrible odds to develop the bonanza which he was positive existed in his mine, and in order to prospect it, about one year ago, he says, he made a contract with J. P. Wheeler to sink the shaft to a depth of 300 feet, Mr. Wheeler to pay him $300 and receive 15,000 shares of stock in the mine in return. The shaft was sunk to a depth of 235 feet when a vein of very rich black sulphuret ore was struck. At the same time a body of water was tapped which caused a suspension of work until proper machinery could be procured, a whim having been used for hoisting up to this time.

Mr. Wheeler failed to get suitable machinery and did not complete his contract. The case was carried to the courts and after long litigation Colonel Keyes won the suit, and Wheeler not having fulfilled his contract, forfeited the 15 000 shares of stock. The Colonel then started in to get machinery on his own responsibility, and finally succeeded in procuring an engine, and last week started work in the shaft.

The Keyes mine is situated on the east side of Seven-mile canyon road, near its junction with Six-mile canyon. The shaft is now down 235 feet from the surface and the bottom and sides are streaked with veins of rich black sulphuret ore assaying several thousand dollars per ton. The Colonel declares that he will be a bonanza king before he sinks 20 feet farther. —*Virginia Chronicle, Nov. 25th.*

PROSPECTING AN OLD MINE.—Frank Reed and two other practical miners are now prospecting the old Adams mine, near Unionville, and taking out very good ore. The mine was discovered about a dozen years ago, and was then prospected to a very limited extent only. It is situated in a metamorphic lime-stone formation, similar to that in which the Arizona mine is located, and the indications are that it will prove to be very valuable property. There are a dozen or more leads near Unionville, which, when developed, will make the old camp as prosperous as it was in the palmiest days of the Arizona mine.—*Silver State.*

THE total value of California's products for 1884 is estimated at $1,000,000. About $56,000,000 will be exported, consisting of wheat, barley, flour, wine, brandy, wool, salmon and canned fruits. Wheat leads the list of exports—1,5000,000 tons, valued at 340,500,000.

ENGINEERING NOTES.

The Panama Canal Company.

Mr. Slaven is now President of the American Construction and Dredging Company, of New York. He has just returned from Europe, where he signed a contract to do 30,000,000 cubic meters of dredging on the Atlantic side of the Isthmus, and communicated some comparatively new facts in regard to this great work. Mr. Slaven's company has three mammoth dredgers at work, with from 500 to 700 men. The foremen are all Americans, and the others are natives of the tropics, mostly from the Island of Jamaica. They work 12 hours a day, and receive about $1.20. The climate of the Isthmus is not healthy, but its rigors have been exaggerated. The death rate is far less than reported. If a man remains at work six months his fare is paid back to the country he comes from. The dredgers now at work dig 3,500 meters a day; a larger proportion of work by 50 per cent than was done at Suez. It is contracted to complete the 30,000,000 meters by 1877, and in order to have this gigantic undertaking finished on time, Mr. Slaven is now having built here 12 new dredgers, to cost, when finished, about $1,500,000; so American industry is being benefited by the canal.

Mr. De Lesseps will arrive on the Isthmus the last days of February next, to remain a month and return by way of New York. Mr. Slaven promises, before Mr. De Lesseps arrives, to have seven miles of the canal, from Colon to Gatun, open and navigable for vessels drawing 13 feet of water. The entire canal is guaranteed to be finished by 1888, and Mr. Slaven, after three years of experience on the isthmus, sees no reason why it will not be ready on time. There is no lack of funds and no difficulty in getting men for the work. The dredger used is, by the way, a California patent, the invention of General Tom Williams, of Oakland, and a smaller one is now being used by the General on his property at Union Island, in the San Joaquin.

PROPOSED RAILWAY FROM ENGLAND TO INDIA.—A proposition has been brought forward abroad to form a direct railway line from England to India. The route proposed is Paris, Madrid, Gibraltar, Tangiers, Tunis, Tripoli, Cairo, Bassorah, Kelat to Kurachee and Bombay. The nominal capital is fixed at £10,000,000. It is intended to profit by the existing railways in France and Spain, and to establish a steam transit from the Bay of Gibraltar to Ceuta, in Morocco. From this latter point would begin the International Railway, the works of which would have to be constructed in Morocco. This line would form a junction with the system of railways under the administration of the French Railway Company, in Algeria and Tunisia, giving communication from France to the various lines and branches to those provinces. It is then proposed to continue the route through Tripoli to form a junction with the Egyptian railway system. From Egypt the route to India would be continued to reach the Euphrates, and then along the coast of the Persian Gulf to the port of Kurachee, in India. At that point the great Indian system of railways would be reached, communicating with Bombay, Calcutta and Madras. The entire line from London to Bombay has been calculated to extend over a distance of under 7,000 miles, and this distance, it is said, can be traversed in nine days, at the average rate of 35 miles an hour.

THE EADS SHIP RAILWAY.—Captain Eads appears to be in no way discouraged with the progress he is making to float his scheme for a ship railway across the Isthmus. He has had an elaborate model of his work constructed at a cost of $10,000 which he had exhibited in London and New York. He will also set it at the New Orleans World's Exposition. It exhibits a ship six feet long, the pontoon and apparatus for lifting the ship, and the carriage upon which it rests out of the water, about 20 feet of the permanent way, and the floating turn-table which is to take the place of the ordinary curve. But little is said by the captain or his friends about the financial situation of his scheme. It is said, however, that there are 69 stockholders in the enterprise, comprising capitalists from Pittsburg, Louisville, St. Louis and New Orleans. Of the $45,000,000 capital subscribed, $270,000 is already expended on the railway, which is to be 160 miles long. The estimated cost is $75,000,000. The terms of the Mexican concession require the completion of the railway in nine years.

THE CALIFORNIA SOUTHERN RAILROAD.—From an official of the California Southern Railroad, which connects Colton, on the Southern Pacific, with San Diego, we learn that it is to be continued to San Bernardino, and still farther northward to make connection with the Atlantic and Pacific as soon as labor and material can put it there. It will then form the western outlet of the Atchison, Topeka and Santa Fe system. The road is owned by the same powerful combination of Boston capitalists which controls the Atchison, Topeka and Santa Fe. It is upon the California Southern that the people of San Diego pin their faith, as it is the only railroad which reaches that city. Its value will be greatly enhanced when connection is made as above.

USEFUL INFORMATION.

To Repair Looking-Glasses.

Clean the bare portion by rubbing it with fine cotton, taking care to remove any traces of dust and grease. If this cleaning be not done very carefully, defects will appear around the place repaired. With the point of your knife cut upon the back of another looking-glass around a portion of the silvering of the required form, but a little larger. Upon it place a small drop of mercury; a drop the size of a pin's head will be sufficient for a surface equal to the size of the nail. The mercury spreads immediately, penetrates the amalgam to where it was cut off with the knife, and the required piece may now be lifted to the place to be repaired. This is the most difficult part of the operation. Then press lightly the renewed portion with cotton. It hardens almost immediately, and the glass presents the same appearance as before any imperfection was noticed.

CLOTHES PIN APRON.—Eureka, no more trouble with clothes-pins, no more up and down movements like the walking beam of a steamboat, to pin the clothes on the line, one arm up, holding on the clothing, the other down, struggling to grasp a clothes-pin from the basket. Take a strong piece of cloth, calico or any material you choose, and cut it as you would the upper part of an apron, with two gores (of course no bib is required), about 12 inches long. Then cut another piece to fit the bottom of the first one about 8 inches long and a trifle wider at the top. Hem the top and sew the short piece to the other at the bottom and sides, put a band on the top, and don't forget to put on long strings, so your husband can tie it around his waist, and your apron is finished, and washing day is robbed of at least the one-hundredth part of its horrors. This apron serves as a bag in which to keep your clothes-pins when not using them, and is always ready.

SOLDERING ALUMINUM.—Col. William Trismath, of Philadelphia, says: The following recipes to solder aluminum have been tried by me and found practical: Take 10 parts silver, 10 parts copper, 20 parts aluminum, 60 parts tin, 30 parts zinc. The above solder is excellent for chains, etc., and can be used for blowpipe operations. For a solder with the common solder iron, take either 95 parts of tin, 5 parts of bismuth; or 97 parts of tin and 3 parts of bismuth; or 98 parts of tin and 2 parts of bismuth; also 99 parts of tin and 1 part of bismuth; the fuse to use in all cases is either paraffine, stearine, vaseline, balsam copaiba, or benzine. Articles so soldered must be cleaned well before soldering, and the parts to be soldered must be heated just enough to make solder adhere to the parts to be soldered. These alloys of solders, as above stated, can be changed to suit the operator.

IVY LAWNS.—Ivy lawns are known to but few among the many who are interested in gardening economy. They consist, as the name implies, of ivy only, and they offer some peculiar advantages in cases where grass lawns are apt to occasion more trouble than they are worth. According to the *Farmers' Gazette* (Dublin), an ivy lawn may be well made in one season, and if the primary operation of planting be properly performed, the lawn will make itself; it will want no cutting, no sweeping, no watering, no protection from the birds that eat the grass seeds to-day and to-morrow scratch up the tender plants, as though it was their mission to make grass lawns impossible. And when made, being as it were self-made, an ivy lawn will take care of itself for any number of years; but if in need of repair or trimming, the knife may be used.

PAINT FOR PROTECTING ROOFS.—There are frequent inquiries about the use of coal tar paints for roofs. A writer says: I have had twenty years' experience in the use of coal tar mixed with ground slate, iron ore, mineral paints, and the so-called asbestos—all about alike—and I know what I am talking about. They are unfit to use on wood or tin. They will cause wood shingles to crack and curl, and tin to corrode. A gentleman of utmost reliability has just told me that two new shingle roofs were last fall covered with a preparation of coal tar, petroleum and ground slate, and they are ruined—the shingles have curled up, and the owners are preparing to new-roof the buildings. However valuable coal tar may be for some uses, it is not fit to be used on shingles, or wood exposed to the sun and weather.

THE LATEST NOVELTY in burglar alarms is the "electric mat," which can be hid under the carpet, and will ring continually if once stepped upon by an intruder. The simplicity of the device will probably rapidly gain it public favor. This device will be on exhibition at the forthcoming Boston Exhibition of Electrical Science—an exhibition which the Boston folks think will eclipse the Philadelphia exhibit.

PRESERVING AND RENEWING PAINT BRUSHES.—Recently we found a flat bristle brush, two inches wide, in the cellar of a house we had rented. It had been used in white lead and left in a wretched condition. By cutting off a layer of bristles on the outside, and soaking it two or three days in kerosene oil, the bristles became pliable, and were easily cleaned by a free use of the oil and by working the brush on a piece of board. It was used about the house, then cleaned out in the oil and set in a clean, dry can, where it will remain soft as silk. Brushes kept about the house for any purpose may thus be kept in prime condition, whereas when set away in water they are forgotten; the water evaporates and leaves them well nigh worthless. *Cor. Coach Painter.*

CEMENT FOR CAOUTCHOUC.—According to Pharm. Zeitschrift, fur Russland, powdered shellac is mixed with ten times its weight of strong ammonia, and forms a transparent jelly, which may be liquified by placing the vessel containing it in hot water. This cement serves for uniting pieces of caoutchouc together, or fastening caoutchouc on glass or any smooth substance.

WATER CURTAINS.—At some of the theaters and opera houses in Europe, water curtains are used as a safeguard against fire. Between the acts a wide, tenuous sheet of water descends, separating the stage from the auditorium. Its efficiency was recently proved at the opera house at Munich, Bavaria, when by its means a fire was checked instantly.

MANUFACTURE OF RAILWAY WHEELS BY STAMPING.—A system has been devised at the steel works at St. Chamone, in France, for the manufacture of railway wheels by stamping. The "wheel-center" is constructed in three operations—the formation of the rough piece; the rolling into shape and to the diameter and the finishing off.

THERE will be 600,000,000 pounds of tobacco grown in the United States this season, of which one-half will be manufactured into chewing and smoking tobacco and snuff. There are over 16,000 cigar factories in the country, which last year made over 3,000,000,000 of cigars and 750,000,000 of cigarettes, using 75,000,000 pounds of tobacco.

PLANTING NAILS.—When Captain Cook first visited Tahiti, the natives were using nails of wood, bone, shell and stone. When they saw iron nails they fancied them to be shoots of some very hard wood, and, desirous of securing such a valuable commodity, they planted them in their gardens.

THE BICYCLE.—It is probable the bicyle and tricycle will become in the future as much of a staple article of manufacture as the common road wagon of to-day. In England $15,000,000 are now invested in their production, employment being given to 10,000 persons.

CEMENT FOR PORCELAIN.—Four parts of alabaster gypsum are mixed with one part of powdered gum arabic, and the mixture rubbed up to a thin paste with a saturated solution of boracic acid prepared in the cold.

WORMS IN FLOWER POTS.—A new remedy for the worms which destroy house plants, is a number of sulphur matches placed in the flower pots with their heads down. The experiment has been tried with success.

OIL FROM GRAPES.—In extracting oil from grape seed, young vines yield the largest quantity, and the black varieties more than white.

GOOD HEALTH.

The Perfect Man.

Huxley gives the following table of what a full-grown man should weigh, and how this weight should be divided: Weight, 154 pounds. Made up thus: Muscles and their appurtenances, 68 pounds, skeleton, 24 pounds; skin, 10½ pounds; fat, 28 pounds; brain, 3 pounds; thoracic viscera, 3½ pounds; abdominal viscera, 11 pounds; blood which would drain from body, 7 pounds. This man ought to consume per diem: Lean beefsteak, 5,000 grains; bread, 6,000 grains; milk, 7,000 grains; potatoes, 3,000 grains; butter, 600 grains; water, 22,900 grains. His heart should beat 75 times a minute, and he should breathe 15 times a minute. In 24 hours he would vitiate 1,750 cubic feet of pure air to the extent of 1 per cent; a man, therefore, of the weight mentioned, ought to have 800 cubic feet of well ventilated space. He would throw off by the skin, 18 ounces of water, 300 grains of solid matter, and 400 grains of carbonic acid every 24 hours, and his total loss during the 24 hours would be 6 pounds of water, and a little above 3 pounds of other matter.

JOINING SEVERAL PIECES OF FLESH.—If a child is so unfortunate as to chop off one of his fingers with a meat axe, it does not follow that he is to remain mutilated for life. Dr. Fave, of Finisterre, was called to one whose first finger was hanging by a small piece of skin. Not being willing to do surgical work at night, he put the finger in place and braced it with a couple of corset bones. Next day the finger was doing so well that he did not disturb it. In 4 days there was evidence of union; in 10 days the child could move the finger, and in a month he was completely cured. No stitches were used. Dr. Fave thinks that there is too much hasty surgery, and the editor of the *Journal de Medicine*, in agreement with him, says that with modern surgical dressings, fingers may often be saved, even when completely severed.

RENEWAL OF BRAIN CELLS.—According to the novel computation of a German histologist, who has been calculating the aggregate cell forces of the human brain, the cerebral mass is composed of at least 300,000,000 of nerve cells, each an independent body, organism, and microscopic brain, so far as concerns its vital relations, but subordinated to a higher purpose in relation to the function of the organ; each living a separate life, individually, though socially subject to a higher law of function. The life term of a nerve cell he estimates to be about 60 days, so that 5,000,000 die every day, about 200,000 every hour, and nearly 3,500 every minute, to be succeeded by an equal number of their progeny, while once in every 60 days a man has a totally new brain.

HOT WATER TO DRINK.—One of the latest sensations is the founding of a school of hot water drinkers. It has been hinted in certain quarters that the introduction of the new fashion is to break up the ice companies. Hot water is drunk for its action as a preventive and curative of disease. There has, however, so far been no well-authenticated evidence of its superiority in this respect. A gentleman named Daniel, residing in New York, professes to have 5,000 disciples of hot water drinking. At first the stomach is slightly nauseated by the hot water, but soon becomes accustomed to it, when it is found rather agreeable than otherwise. The English people contend that drinking ice water brings on Bright's disease. This assertion has been refuted by high medical authority, but as there may be converts to the belief who find their refuge in hot water, let them drink it so long as it does them no harm.

BURNING OF THE DEAD.—The body burns, whether placed in the earth or fire; in one case it takes 10 to 20 years, and in the other so many minutes. Cremation is the proper and scientific way to dispose of dead organic matter. When the body is cremated, there is no further fear from disease germs in the body. The only plausible objection which has been offered against cremation, is that in case of homicide, through the administration of deadly poisons, valuable evidence might be destroyed; but this is not a serious objection in the face of the many advantages gained. All innovations in sanitary science have had to fight their way inch by inch. Vaccination had a hard struggle, but came out triumphant, and so we predict for cremation a glorious victory, a triumph of good sense and science.—*Ionia Sentinel.*

MEDICAL VALUE OF THE PASSION FLOWER.—According to Dr. George W. Winterburn, the therapeutic uses of the white passion flower resemble the bromides on one hand and gelseminm on the other. It is one of our best hypnotics, producing a quiet, pleasant sleep, altogether different from the comatose stupor of morphia, and from which the patient may be aroused at any moment. It may be given in doses of two or three drops of the tincture or low dilution. Even in the worst form of sleeplessness, that associated with suicidal mania, this drug will produce quiet slumber, from which the patient awakens with clear mind and rational thoughts. In its control of convulsion, passiflora closely resembles gelsemium. It will be found of service in opisthotonos, trismus and tetanus.—*Amer. Homeopath.*

INGROWING NAILS.—In a note to the *Union Medicale*, M. Monod states that during the last 20 years he has treated ingrowing nails by a very simple and effectual method, which does not involve the removal of the nail. He makes a free application of nitrate of silver at the commencement of the affection, without isolating the nail. If the cauterization is carried deeply into the diseased furrow, the patient has usually, even by the next day, derived considerable relief, and is able, even thus early, to walk in moderation with an easy shoe. Extirpation of the nail should be reserved for quite exceptional cases.

KEEP OUT THE COLD.—Cracks in floors, around the mould board, or other parts of a room, may be neatly and permanently filled by thoroughly soaking newspapers in paste, made of one pound of flour, three quarts of water, and a tablespoonful of alum, thoroughly boiled and mixed. The mixture will be about as thick as putty, and may be forced into the cracks with a case knife. It will harden like papermache.

THEINE AND MORPHINE.—Recent experiments on dogs have shown that the hypodermic injection solution of theine, the active principle of tea, almost instantly counteracts the effect of morphia, animals having been revived after the action of the heart had ceased to be perceptible. Similar properties are possessed by caffeine, the active principle of coffee, but it operates less quickly.

A SINGULAR CASE.—A Plantsville (Conn.) man died the other day from the bursting of blood vessels throughout the body, letting the blood in among the tissue. He noticed black spots on his arms several days before his death, but felt entirely well until the last few hours, when he suffered intensely.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA

Amador.

MIDDLE BAR TUNNEL.—Amador *Ledger*, Nov. 28: The big tunnel at Middle Bar has encountered several stringers of quartz, carrying the same character of heavy black metal, a large proportion of which is free gold, as is met with in the upper tunnel of the Mammoth mine. This fact is regarded as proof positive that the rich pockets which have made the Mammoth so famous, extend to great depth. An idea has prevailed that these pockets did not reach more than 200 or 300 ft from the surface, but experience has proved this notion without foundation. The head of the tunnel is in about 1600 ft, and the main body of pay quartz is likely to be reached within the next 100 or 150 ft.

TIN MINE FOUND.—Col. W. T. Robinson and Wm. N. Waterman, while prospecting last Monday for gold in the neighborhood of Big Bar on the Mokelumne river, discovered a vein of tin some 5 ft in thickness on the Amador side of the river. The ore is very similar to that found in the State of Durango, Mexico. The find is thought to be of great importance. The ore carries a large percentage of metal and the facilities for cheap reduction and transportation gives great advantages over other tin mines heretofore discovered in the United States.

MISCELLANEOUS.—The Matson mill will start up on rock from the Lighthouse mine next Monday. We were shown some splendid specimens of ore taken from the Mammoth mine this week, some pieces valued at $500 to $800. A considerable quantity of this rich metal has been taken out lately. The Moon brothers are running a tunnel east on the Red Cloud mine, on Murphy's ridge, at a depth of 140 ft with the idea of striking the hanging wall, and discovering rich pockets. At the Gover the 20-stamp mill is kept running on the old dump pile. It proves conclusively that marked improvement is being made in gold-saving machinery when refuse material cast aside years ago as practically worthless can now be worked at a profit. The Gover and Lincoln dump piles are being profitably worked at the present time, and within the past two or three years vast quantities of the dump piles at the Amador Con. at Sutter Creek have been run through the mill. The Drytown sulphurets works, under the management of E. S. Barney, are kept steadily running. The sulphurets are obtained from the vicinity of Shingle Springs, Grizzly Flat and other points in El Dorado county. The Plymouth Con. Mining Company have paid their regular monthly dividend this month of fifty cents a share, aggregating $50,000. Total amount paid this year, $550,000.

SUTTER CREEK.—The mining outlook has experienced a sudden change for the better during the last week. The vexatious litigation between the Mahoney and Lincoln has been settled, both sides making concessions, and compromising all matters in dispute. The road is now clear for work to be resumed on both the Mahoney and McAdams ground. Mr. Stewart will probably continue working the refuse dump until the rains set in, when underground work will be resumed. At the Mahoney the supply of material on the ground is rather short, and there is hardly time to get in sufficient timber to carry on work on an extensive scale this winter. Ten stamps of the Mahoney mill have started on rock from the Wabash mine, south of the Talisman. James Wild is in charge of the crushing. About 75 tons will be run through, to test the quality of the ore.

Calaveras.

NORTH END.—*Mountain Echo*, Nov. 29: C. D. Smythe, superintendent of the North End mine, tells us that the mine is improving, and never looked better than at the present time, the last clean-up he says yielded more gold in proportion to the amount of ore crushed than at any other time. Mr. Smythe is running two arastras, to which is attached two stamps, and five more are to be added, which will make seven in all, and will probably reduce from eight to ten tons in 24 hours. Much of the white quartz contains gold in sufficient quantities to pay well for working. A sufficient amount of lumber and machinery for erecting a ten stamp mill on the Invincible mine, is now on the ground. The mill will be ready to run in a month or two. It is said that the mill on the Stickle mine, owned by F. K. Bechtel of Brooklyn, Cal., will be completed in a month. Mr. Bechtel is a man of means, and will, therefore, push the work as rapidly as possibly. As an evidence of the probability of a great mining boom in this section, it may be stated that there are more capitalists here at present, in search of mines, than was ever known within the history of the camp.

WHAT CHEER.—Calaveras *Chronicle*, Nov. 29: This mine, which has been partially worked in former years, but which has remained idle for a long time has again been re-opened by a company from Oakland and is under the management of Mr. Edward Rigney, a young man of energy and long experience in gravel mining. The hoisting works and mill formerly used on the Empire mine in Old Woman's gulch, have been purchased and moved to the What Cheer, where the hoisting works have been set up and put in operation. The incline tunnel has been cleared of water, and the lower portion, where the ground had caved somewhat, has also been cleared of debris and made secure with timbers. The drifts, however, have not yet been freed of the accumulated water. A new "sump" is being dug to facilitate operations and keep the mine clear of water. It is asserted by experienced miners who have knowledge of the channel that there is an extensive portion of that channel that has not been explored, and which there is every reason to believe will pay well, for the Old Blue lead has been famous for its rich yields of gold along its line. The mill has not yet been set up, but will be as soon as the explorations will reveal the existence of a gravel deposit of fair quality and of sufficient extent to justify further expenditures for successful operations. At the Rough Diamond in Chili gulch, but little has been done for some time past other than opening a new tunnel to the diggings. The mill has again been set in operation. As reported a short time since the Green Mountain claim on Tunnel ridge, in Chili gulch, owned by McSorley & Co., has been worked with steady energy for years, and is proving one of the best pieces of mining property in the State. The gravel deposit has been found to be far more extensive than it had been supposed to be, and the lucky and worthy owners have a piece of property that will last for a lifetime. Like most the other gravel mines a portion of the ground had been worked in former years and abandoned because it could no longer be made to pay, having struck a cemented stratum of gravel that would not wash by the ordinary process. The present owners of the mine have extended their prospecting a distance of 1,200 ft into the hill without reaching the east side of the channel, all through gravel that will pay to mill. The length and windings of the old tunnel, causing the work of getting out gravel to be carried on to some disadvantage, another tunnel has been opened north of the old, which will not only facilitate work but give good air to all portions of the mine. This tunnel is as straight as an arrow and on a slight grade, by which a loaded car will come out with speed, the car man only having to regulate the speed by the use of a brake. When the new tunnel is opened, which is now in over 800 ft, by working through both tunnels gravel can be taken out fast enough to keep the mill constantly going. The Duryea mine on the opposite ridge in the same gulch has continued to hold the even tenor of its way. Formerly worked by the hydraulic process and latterly by the drifting process, it continues to be a steady paying property. All the gravel is subjected to the action of stamps and the mill is kept in operation day and night. This mine has been worked for many years and is one of the permanent mining institutions of this vicinity, and has been all along a remunerative property. Notwithstanding it has held out a long time there is yet no likelihood of its being exhausted for a long time to come. In the Gleeson mine, adjoining the Duryea mine, a new incline is being run, as we previously stated, after a suspension of active operations during a portion of the summer. The tunnel is 6 ft in width in the clear with a down grade of one foot in twelve. It is calculated that on the grade allowed, it will be 1500 ft in length before the bedrock is reached. Work is being pushed day and night and rapid advance is being made with the tunnel which is now in some 800 ft. Only a sufficient force of men is now being employed to push the tunnel ahead, and the dirt is drawn out by mule power. In the meantime a powerful Cornish pump is kept at work clearing the old works of accumulated water. In the French claim, located above the last named, nothing at present is being done. It was reported that the intention was to work the claim by the old "Calaveras Tunnel" which would be re-opened for the purpose, but as yet no move has been made in that direction, and operations for the present are suspended. Likewise in the Sullivan claim further up the same gulch and in the diggings formerly known as the "Lumbard claim," nothing is doing. The tunnel has been extended into the hill a considerable distance, but the character of the ground has made progress difficult. The Coffee Mill claim, near the Junction, is being re-opened by Messrs. Champion, Dusnton and O'Neill. The former owners of this claim found good ground, most of it being very rich. The persons undertaking the work of re-opening the mine are all experienced miners and hold to the opinion that the former company got off the "channel," and being unable to strike it again left an extent of good ground which they feel confident of finding. In the Anthony claim, on the east side of Tunnel ridge, a bedrock tunnel has been run to the gravel. Finding themselves too high for the bed of the channel an incline is being run to strike bottom. Work in the Hughes tunnel, just below on the same ridge, is being industriously prosecuted with good results and the best of prospects for a continuance, The Bonanza Hydraulic, near the head of Tunnel ridge, S. S. Moser & Co., proprietors, continues active operations with the best returns to its owners. Vieth & Co., are busily at work constructing their gravel mill, and are making as rapid progress as a force of workmen under the guidance of the well-known millwright, C. F. Brock, are capable of making, and it will not be long before everything will be in running order. The Kramer mine in Poor Man's gulch is still being worked. There are but few men at work, just sufficient to push the tunnel which is now some 1400 ft in length, to gravel. About 50 ft further of tunnel will reach the gravel, when it is contemplated putting up a gravel mill. Work has been prosecuted in this mine for about 8 years, during a part of the time the bedrock tunnel mentioned was being run to work the ground to better advantage.

El Dorado.

THE SHEA MINE.—Thomas Davidson and F. B. Tuck of Shingle Springs are at work prospecting the Tom Shea mine, near Sportman's Hall, about 10 miles east of Placerville, and have every indication of a good property. We sincerely hope they may not be disappointed, since they are both deserving citizens, and any money they make will be invested in the county.

GOPHER BOULDER.—Under the able management of Supt. F. E. Morse, this mine is rapidly developing into one of the best in the county. The fine new 20-stamp mill is kept constantly running, and ore taken out will go as high as $200 per ton. The self-feeders, rock-breakers, etc., are working to a charm, and when a clean up is made, about the 20th of the coming month, we shall expect to chronicle something that will be a surprise to those even who have had most faith in the property. As showing what Supt. Morse thinks of his mine, it is only necessary to say that he has already decided to build a commodious residence near it, and make his home in Kelsey township.

THE FLORENCE MINE.—This mine is on the greenstone belt, in Mud Springs township, owned by F. B. Tuck, and believed by many to be one of the best properties in our county. For some months past no work has been done for want of sufficient funds to properly open the mine. Last week arrangements were perfected by which work will be resumed at an early day, and a thorough prospect of the mine made.

Kern.

KRAMER DISTRICT.—Calico *Print*, Nov. 29: A meeting of the miners of Kramer was held at Kramer Station, Keru county, Nov. 20th, for the purpose of forming a mining district, passing by-laws, and electing a recorder. J. L. Coffman was elected. A set of by-laws were then adopted, including the following boundaries of the district: Kramer Mining District shall be bounded as follows: Commencing on the line of the Atlantic and Pacific R. R., east of Kramer, at the San Bernardino county line, running south to the Los Angeles county line, thence west along the line dividing Los Angeles county from Kern county, as far west as the Buckhorn ranch, thence in a northerly direction to Rogers' Station, thence in an easterly direction along the line of the A. and P. R. R., to the point of beginning. The prospects for Kramer district are improving. Mr. Kilgore is getting out some good ore from the Belden mine. Coffman & Co. are down 20 feet on their gold ledge. They have a good prospect. Several parties are expected to arrive in the camp soon to examine the mines with a view of purchasing.

Nevada.

NEARLY READY TO START.—Nevada *Transcript*, Nov. 29: Contractors Garver and Nihell expect by Thursday to have their part of the work completed on the hoisting and pumping works at the Texas mine, Willow valley. It is the intention of the owners to have the machinery running regularly by next Monday.

MINING UNDER A STABLE.—While some digging was being done under Hennessy's livery stable Tuesday to strengthen the foundation the croppings of a ledge—probably the Fleming—were struck and a lot of good looking ore came to light. One piece as big as a man's fist was very rich in free gold.

HOISTING WORKS.—J. C. Locklin, who has made arrangements to develop the quartz mine on Chapman's ranch, will have the hoisting and pumping works completed and ready to run within about ten days. Considerable good ore has already been found there, and it gives promise of proving a very valuable claim.

HYDRAULIC MINE STARTED.—*Transcript*, Nov. 29: The Hennessy hydraulic mines on Broad street, opposite the National Exchange Block, was started up yesterday morning, and at a late hour yesterday afternoon a large body of earth had been washed away. The water was obtained from the hydrant in front of Wells, Fargo & Co's express office, and conducted across the street to the claim by means of a big fire-hose. The slickens, after passing through the sluice, is dumped into the Main sewer in that part of town, and flows thence into Deer creek. As the mine is located directly under a livery stable, the grangers in the valley will have hard work proving that the "tailings" from it are an injury to their unfertile ranches.

Placer.

THE OLD CROESUS MINE.—Placer *Herald*, Nov. 29: Messrs. Norton & Hooper, who are working the old Croesus ledge in Baltimore ravine, about a mile south of town, and whose good prospects have heretofore been mentioned in the *Herald*, had a crushing from the mine last week and realized $25 a ton from their rock, besides the sulphurets, which, it is thought, will bring up the yield $3 more, or to $28 per ton. Messrs. Norton & Hooper are good miners and the men at work for them are good miners. They have expressed confidence that the mine would pay from the time they first took hold of it, and the yield they have realized from their first crushing shows their confidence was well-founded.

THE BOWEN AMALGAMATOR.—We understand that one of the new Bowen amalgamators, the invention of A. C. Bowen, of Michigan Bluff, this county, has been put up at the Rising Sun mine at Colfax. Mr. Bowen claims for his invention great superiority and its workings as far as tested, we understand, give grounds for his claim.

Plumas.

GREEN MOUNTAIN.—Greenville *Bulletin*, Nov. 29: The No. 6 tunnel is in the mountain 3,240 ft and is being pushed ahead at the rate of from 20 to 25 ft per week. It is 17 ft from the face to the Sulphuret Chute. Work is progressing smoothly. About 75 men are employed in connection with the mine.

THE MORNING STAR.—This is a ledge situated in the Cherokee district, and adjoining the Cherokee mine. Mr. Bachelder, one of the owners, has been prospecting the ledge for some time. He concluded to make a test of the rock, and for that purpose leased the Arcadian mill for a few days. Twenty-two tons were crushed. It yielded a little less than $8 per ton. If much of such ore could be had, the mine would become a handsome piece of property. We hope a large body of the ore shall be developed.

THE N. Y. CENTRAL.—About two months ago Judge Emmons leased the N. Y. mill for a short time to crush ore from a mine adjoining the New York. The lease having expired, the mill has stopped, for the winter at least. Work on the ledge will continue. The vein is not very large, but it has paid a good profit. It is to be hoped that the New York mine will be in shape to operate next spring. The settlement of the May estate has prevented the working of the mine, which previous to Mr. May's death, paid handsomely. Work on the Taylor-Plumas continues. Work on the Southern Eureka is progressing favorably. It is reported that the Kettle quartz mill will be repaired soon. Notices are posted in town asking for bids to haul quartz from the Eno mine to the Arcadian mill. The pumps have been taken out of the Crescent mine, and it is stated they will remain out until the legal difficulties in which the property is involved, are settled. Higbie & Leet have begun to sink a new shaft on their location at Crescent. This is on the ground which is in dispute between Higbie & Leet and the Crescent Company.

San Bernardino.

IVANPAH ITEMS.—Calico *Print*, Nov. 20. Last Tuesday our office was favored with a call from Mr. J. A. Bidwell, of Ivanpah. He reports the mines in that district are looking well. There are five mines in operation as follows: The Lizzie Bullock, owned by J. A. Bidwell, is down about 300 ft. The ore lies in pockets which are very rich. Only the high grade ore is crushed, which is done at Bidwell's 10-stamp mill at the town of Ivanpah, five miles from the mine. The force in this mine are at present principally engaged in dead-work. It is expected that enough ore will be taken out to start up the mill for another run in January next. The Ally mine is owned by J. S. Ally and John Cochran, and is showing up well. The work on this mine has been confined to the surface, the object being to get at the rich pockets of ore without any regard to systematic mining. It will be necessary to sink on the mine in order to determine whether the mineral is confined simply to surface deposits. The Wahparagut is owned by Ole Ingebretson. Some ore has been taken out of this mine and the prospects at present are good. The Stonewall is owned by B. M. Lawrance. A tunnel is being driven in this mine and there is enough ore in sight to justify opening up the mine in good shape. The Alps is owned by Wm. L. Miller. A shaft has been sunk in this mine and also a tunnel to connect with the same. A winze is also being sunk in this level. The ore in this mine is found in bunches, which are so rich and at such short intervals from each other as to yield good returns in bullion. The Eugene is owned by J. A. Bidwell and has been leased to other parties who are taking out ore and feel confident they will strike a rich pocket that will yield them enough to buy a mine of their own. There is another mill at Ivanpah besides Bidwell's, but it is not in operation. Ivanpah district is a very large one and extends into Nevada. In the northern part of the district some good galena and copper ledges have been located and all that is necessary is capital to open them up. Mr. Bidwell feels confident that Ivanpah ere long will be a flourishing camp and have a bullion output second to none in this county.

Sierra.

ACTIVE WORK AT THE ALASKA MINE.—Sierra *Tribune*, Nov. 28: Eighty men now find steady employment around the Alaska mine at Pike City, while about twenty others find employment at present in the timber getting out wood for the company. The water in the mine is under complete control. Preparations are now being made to place a Worthington compound pump in the mine. This pump has a capacity of 1,000,000 gallons in twenty-four hours and will be capable of raising the water from the present depth of the mine, 500 ft, to the surface in a single stroke. The weight of the pump is 26,000 pounds. It is not probable that they will ever experience any further difficulty in handling the water after that pump is put in operation. At present a considerable amount of dead work is being done around the mine. The 20-stamp mill is running constantly with good results; the yield of the ore being more than sufficient to meet all of the expenses of the mine. Col. E. P. Bates has succeeded Mr. Davis as superintendent. He informs us that it is the intention of the company to thoroughly develop the mine and to double the milling capacity as soon as circumstances will warrant the increase. The underground workings of the mine are looked after by Mr. Frank Gluyas, a practical miner.

A MINING ITEM.—Mr. C. C. Smith, of this place, was up in the vicinity of Poker Flat this week on business connected with the Grand Prize gravel mine, in which he is a stockholder. The Grand Prize is pronounced by practical miners to be one of the very best placer locations in this county. The company propose to put some men at work in the tunnel soon. That mine is quite likely to prove a nice little "nest egg" to its owners one of these days. We hope it will. Mr. Smith is also interested with three other parties in what is known as the German gravel claim, located about one mile above Poker Flat. At this mine they have a shaft down 50 ft and are drifting in a fine body of blue lead gravel. The gravel yields something over one dollar per car-load. Three men are working there and they raise from 15 to 20 car-loads of gravel per day. A Pelton wheel has been placed in position which furnishes power for hoisting purposes. The shaft is thus far free from water. Mr. Smith returned home well pleased with the outlook in that quarter.

ALLEGHANY.—Times are rather quiet in this neck of the woods. However, in a quiet way, there is considerable prospecting going on in both quartz and gravel. The most important enterprise being carried on in this vicinity at present is the operations of the Rainbow Company. Progress in the tunnel is made at the rate of about 50 ft per week. It is now in 2,100 ft. Stringers to the ledge have recently been encountered and it is expected that the main ledge will be reached in another 150 ft. The company have laid in a full stock of winter supplies, and the work of development is to be energetically pushed. The management of the mine is under the efficient supervision of W. H. Hanley. About one mile below the Rainbow, on Kanaka creek, is located the Spohn mine, owned by J. T. Bradbury. He has two shifts at work running a hard rock tunnel, about 200 ft of which is completed; 150 ft more will have to be run before the pay chute is tapped. Some very rich rock has been taken out in former workings of the Spohn. The owner of the Rising Sun mine, F. Hauber, has driven ahead the upper tunnel on the ledge and has met with excellent prospects. We were shown some fine-looking rock taken from this portion of the mine, containing free gold in abundance. Work has again been commenced on the Boles quartz ledge at Minnesota. This mine adjoins the Plumhago. Some years ago pockets were encountered in the Boles mine which yielded its owners thousands of dollars. At present a raise is being made from the lower to the upper level for the purpose of securing air. A tunnel is being run on the old Union claim at Cumberland by Sager Bros. They are seeking for a front channel. Sager Bros., of Gibsonville, and Jos. Lowell, of Quincy, are the owners. In the Buckeye gravel mine the company have been to considerable expense the past summer, repairing tunnels and running gangways. However, this work is about through and the company are now ready to commence taking out gravel. At the Gold King mine the tunnel is in very hard rock. Over 500 ft of tunnel will have to be run before the ledge is encountered. At present the tunnel is in about 160 ft. The "Tightner" Company are raising from a new tunnel which they have recently run to the old. They have been doing dead work for nearly a year past.

A BIG MINING SCHEME.—Mr. George W. Cox, Esq., a prominent mining operator of Howland Flat, was in Downieville Saturday, en route to Oakland, where he resides with his family during the winter months. The mines over that way in which he is interested have quit work for the season. Mr. Cox gave us a very hurried account of an important mining enterprise about to be inaugurated at Scales Diggings, the particulars of which are as follows: The Cleveland and Sierra Hydraulic Mining Co., and the Sierra and Union Water Co., whose claims embrace a large area of valuable placer mining ground in the vicinity of Scales Diggings, have consolidated. It is the intention of the company to start a tunnel very soon at the lower end of the Cleveland mine and run it along the channel, working the ground by the drifting process. Mr. Cox

informs us that the gravel lead embraced in the consolidated ground is three miles in length and if it proves profitable as drifting ground, the whole distance will eventually be tunneled and drifted. When the tunnel is run in a couple of thousand ft the cars will be operated with a cable and reel upon the same principle as the cable street cars in San Francisco. The water used for this purpose will also be used in washing the gravel. The Cleveland mine has heretofore been worked by the hydraulic process. A successful result to these operations will go a long way toward restoring life and business activity in northern Sierra.

NEVADA.

Washoe District.

ALTA AND BENTON.—*Enterprise*, Nov. 29: The lower pumps at the Alta and Benton were lost Tuesday night. Since they have been running the two bailing tanks, and the water is fast rising. The pumps cannot again be used until the water has risen to the 1850 level. When both the pumps and the bailing tanks were running at their best speed, they were able to take out 700 gallons of water per minute, while the influx was about 800 gallons per minute. Thus it will be seen that even while they were doing their best, the water was gaining on them at the rate of 140 gallons per minute. It now looks as if it will be impossible for the Alta folks unaided to handle the great flow of water they have tapped. The water was yesterday up to the 1900 level, and unless the Silver Hill and Jacket folks shall start their pumps and assist, it is pretty certain that it will be necessary to shut down, as the mine is sure to be flooded. Meantime the two bailing tanks are kept running, awaiting instructions from below.

OPHIR.—It is found that the west drift on the 500 level of the Ophir has about 100 ft to go to reach the old workings. It has been ascertained that a mistake was made in the survey laid down to the old working map of the mine—a mistake of 100 ft. The ground is still very soft, and great care must be taken in pushing ahead the drift. Burleigh drill holes are kept well ahead. The ground is so soft and clayey that the diamond drill cannot be used in it. Some of the ground passed through swells very badly, and yesterday the men had come back and were casing the timbers. Some ore is still being obtained from the fillings of the old drifts on the 250 level. On the 1500 level a west cross-cut is being run from the south drift. As yet no ore that will pay for working has been found in this cross-cut.

HALE AND NORCROSS.—On the 2800 level they are now cleaning out the main north drift, putting in air pipe and preparing to start two or three cross-cuts. Work was discontinued in the north drift on the 2900 level on Thanksgiving Day and the men put to work in the winze below that level. This winze is now about 50 ft below the 2900, and will be put down to the 3000 level as rapidly as possible. At the Chollar-Norcross-Savage shaft the large station at the 3000 level will soon be completed and ready to receive the new hydraulic pump.

SIERRA NEVADA.—The west cross-cut on the 3000 level, 80 ft north of the joint winze, has not yet cut anything of more value than was found in the drift.

UNION CON.—At the 3300 level of the joint Ophir, Mexican and Sierra Nevada winze there have been run from the station diamond drill holes to the north, south, east and west and northwest, and a hole is now being run to the southwest. The rock in which the drill is now running consists of alternate stratums of hard and soft material.

COMBINATION SHAFT.—The big pumping station a few feet below the 3000 level, is fast nearing completion. Much of the machinery of the new hydraulic pump, which is to be set up in this station, is now on the ground, and the remainder is on the way from the manufactory in San Francisco.

CALIFORNIA AND CON. VIRGINIA.—The usual progress is being made in the northwest drift on the 1750 level. As yet no cross-cuts have been run on this level. As it is running diagonally across the vein it is in itself in a manner a cross-cut.

EXCHEQUER.—Active explorations are now in progress on both the 600 and 900 levels. On both levels are large bodies of metal-bearing quartz, and the indications are good for finding paying ore at some point.

UTAH.—The repairs to the incline were completed last week and work resumed in the southeast drift. The drift is passing through vein porphyry, showing seams of clay and stringers of quartz.

ANDES.—Quartz of a promising character continues to be found in the drifts that are being run north and west, but not much ore that will pay for milling has yet been encountered.

SAVAGE.—The E-street tunnel is now about to the point where it will encounter the northern continuation of the ore body that is being worked in the Hale and Norcross.

SCORPION.—On the 500 level the north drift continues in vein porphyry, with occasional streaks of quartz and small seams of clay. Not much water is encountered.

GOULD AND CURRY.—The west cross-cut on the 825 level at the Savage north line is still in quartz of a fine appearance and giving low assays. It is yet a long way to the west wall.

BEST AND BELCHER.—The west cross-cut on the 825 level on the north line of the Gould and Curry is making good progress through alternating strata of hard and soft rock.

BELCHER.—A considerable amount of low-grade ore is being extracted and the usual exploring work is being done for the purpose of opening up new ground.

YELLOW JACKET.—A considerable amount of ore that will pay a fair profit for milling is being taken out and the usual prospecting work is being done.

OVERMAN.—Are extracting about the usual amount of ore from the old upper levels, which ore is being worked at a mill on the river.

CROWN POINT.—About the usual quantity and quality of ore is being extracted and sent to the mill.

Bristol District.

CLOSED DOWN.—Pioche *Record*, Nov. 22: Tuesday morning, the 18th inst., the Day furnace was closed down for the winter. The day prior 137 bars of bullion were produced from about 15 tons of Mendha ore—this being by far the largest quantity of bullion ever turned out by the furnace in 24 hours or at least since running under the auspices of the present company. The fact of the furnace having closed down is a deplorable one to everybody yet possibly good results may accrue from it. The big bill just above here is fairly teeming with mineral, in fact it's ringed, streaked and speckled with it, from the divide to Pioche, and undoubtedly several of our local prospectors who were content so work at the furnace so long as it run, will now take to the big hill and delve deep down into it for hidden treasures, and who can tell that a second Horn Silver mine will not be found by some devil born to good luck? One day prior to Garrison's discovery of the rich deposit known as the Jackrabbit mine, there was not a person in the county who would have given a solitary two-bit piece for the entire district. Then closely following the Jackrabbit discovery Uncle Abe Rickard pounced upon the Hillside.

Columbia District.

MOUNT DIABLO.—*True Fissure*, Nov. 29: The incline is now 416 feet below the third level, and the station for the sixth level has been finished. The north crossent on the sixth level is in 30 feet, but shows nothing of value. The west drift on the fifth level has advanced 10 feet, and the face shows six inches of $100 ore. The upraise from the fifth level is up 12 feet, and shows a little low-grade ore. A little $50 ore is being taken from winze No. 1, between the fourth and fifth levels, and the ledge looks promising for opening. The intermediate, between the third and fourth levels from winze No. 6, is yielding some $100 ore from a strong ledge. Some $30 ore is being taken from the intermediate, between third and fourth levels near winze No. 5. Two shifts are working in the "big stope" on the first level, and are getting some $100 ore.

Esmeralda District.

ABOUT AURORA.—Bodie *Free Press*, Nov. 26: The *Press* has it from reliable authority that Col. A. C. Ellis of Carson on Saturday last purchased the Thanksgiving mine at Aurora, paying therefor $10,000. It is supposed the purchase was made for Eastern parties. In the words of our informant, "Charley Newton struck it big in the Antelope mine Saturday, and the town is quite 'enthused' about it."

Garfield District.

THAT MILL AT KINKEAD STATION.—Virginia *Enterprise*, Nov. 29: It appears that no part of the machinery from shaft No. 4, on the Sutro tunnel, will be used in the new mill about to be erected by Joshua Moss at Kinkead Station, on the Carson and Colorado Railroad. The mill about to be erected by Mr. Moss will contain ten stamps, with pans, settlers and all else complete. Boilers, engine and all else appertaining have been manufactured at the Fulton Foundry, on the Divide. The whole of the machinery is new, and the last car-load of it was shipped out to Kinkead Station last Saturday. Mr. Moss has some fine mines in Garfield district, the ore from which will be worked at his new mill. Machinery from the old works at the shafts on the line of the Sutro tunnel is being shipped to points in Southern California.

Sprucemont District.

A PROMISING MINE.—Eureka *Sentinel*, Nov. 29: At Sprucemont, Elko county, the mine owned and operated by Jasper Harrell and Mr. Scheriff gives such flattering prospects, as to justify the erection of a 20-ton furnace, and the machinery is now in transit to the mine, and will soon be placed in position. The proprietors are sanguine of the complete success of the enterprise. They have now on the dump some 1,400 tons of paying ore, while there is a large body in sight, which can be easily extracted.

Tuscarora District.

DEVELOPMENT IN THE GRAND PRIZE.—*Times-Review*, Nov. 29: The Grand Prize will make another shipment to-morrow of about $14,000. The recent increase in the weekly shipments is attributable to the improvement in the dimensions of the ledge and the quality of ore in the workings, some five or six hundred feet south of the old shaft. The ore body is on what is known as the South ledge, and the recent development is between the 200 and 300-foot levels. The ledge in the stopes is from four to eight feet in width in many places, and nearly all a good quality of milling ore. The stope is about 120 feet in length, and has been raised from the 400. As it is all virgin ground above, below and to the south, it is impossible to estimate the extent of the ore connection in any of those directions. It is quite certain, however, that the appearance of the mine is more favorable than it has been at any time since the dividend-paying period, and its prospect for future production proportionately encouraging.

Union District.

OPENING A MINE.—Belmont *Courier*, Nov. 22: William Martin, with the help of San Francisco capital, is opening up the George Martin in Berlin Canyon, Union mining district. The main tunnel is in 120 ft, and 20 ft from its face a strong ledge two and one-half ft wide has been cut showing ore of a good grade all through as far as it has been drifted on. It is the intention of the management to build a mill for the reduction of the ore as soon as the mine is sufficiently opened to warrant it. Work is being pushed steadily in the Indianapolis mine, with very flattering indications of opening up a paying property. Years ago this mine produced ore in good quantities of a high grade.

ARIZONA.

THE ARIVACA CAMP.—*Index*, Nov. 26: Work is being pushed on the old Con. Arizona mine, some forty men being employed. The 10-stamp mill, belonging to the company, has until now been worked on custom ore and tailings, but it is expected that sufficient ore can be extracted from the mine to keep a still larger number of stamps busy. To that end additional shoes and dies and other fixtures have been sent for. The water has been pumped out of the mine, and everything is ready for work. They have a 3-ft solid ledge of ore. The main shaft is down 213 ft, with drifts on the 100, 150 and 200-ft levels. A large amount of money has been expended in hoisting works and building. The Con. Arizona, as well as the Silver Eagle, an equally promising claim adjoining, are the properties of the Arizona Mutual Silver Mining Company of New York. The future of the Arivaca mining district is to a great extent depending on the success of this company, English capitalists of large wealth being ready to make investments there in case they see that mining can be profitably carried on in that section.

NOTES.—*Sunshine and Silver*, Nov. 26: The Mammoth, a location eight miles south of the Tiger, in Yavapai county, has a ledge 10 to 60 ft wide on the surface, and crops for over two miles. We hear unfavorable reports of the San Carlos copper mines. The Golden Fleece mill, at Cave creek, Maricopa county, is working steadily on ore from the Phœnix mine. Zeckendorf & Co., of Tucson, are shipping a considerable quantity of ore purchased in small quantities of "chloriders."

SMELTER.—Prescott *Courier*, Nov. 25: The United Verde company's smelter, at Jerome, in this county, is constantly running out copper, which is shipped East. Another smelter is on the ground, and will, it is said, soon be set at work. The company will send several tons of ore and great chunks of metal to New Orleans. Superintendent Craigue is now shipping about twenty-five tons of silver ore per day from the Dosoris. N. L. Griffin, just from Walker district, tells of busy placer miners. Quartz miners are doing assessment work. C. Y. Shelton, who owns several mines in this district, will go to New Orleans with ore from the same. A party of prospectors, from Maricopa county, outfitted at the O. K. store, yesterday, and started in direction of Black Hills district. Mr. Fulkerson, who has charge of the office in Schurman Bros.' hotel (formerly Dan Hartz's), has a force of miners at work in Turkey creek district.

COLORADO.

RED MOUNTAIN ITEMS.—*Miner*, Nov. 29: Shipments from the National Belle continues regular. A number of Minnesota gulch properties are undergoing development. The lessee of the Alaska, in Poughkeepsie gulch is well pleased with recent developments there. The lessees of the Sailor Boy continue work and feel very much encouraged at the appearance of the ore body. Six men are employed and a fine quality of ore is being placed on the dump. The Yankee Girl force of 40 men are employed in the shaft and in sinking a winze from the floor of level No. 1, at a point where work has been suspended for about one year past. The winze is being sunk on a fine body of copper ore showing strong in brittle silver. James Duggan has taken a contract to drive a 50-ft tunnel on the west end of the National Belle mine. The major part of the work on the Belle is being done by contract. The new buildings, including a powder house, are completed, and a large quantity of timbers and cord wood stored at the mine. The Dutton is situated a short distance to the east of the Yankee Girl, and is being steadily worked by Exion, Davis and W. E. Hasky. This property a few days ago was a good prospect, now it is a mine, and with a little more development will make the older mines in that vicinity look well to their laurels. Quite recently a contract was let to Exion and Davis to drive the cross-cut tunnel 100 ft. At a point about 75 ft from the tunnel's mouth a large body fine galena ore was found, several tons of which have been placed on the dump. This claim was located by H. G. Burt, who sold it for a small figure to the present owners, the Dutton Bros., of Ouray, who are justly proud of their new bonanza. The Genessee people are happy again over recent developments in the shaft. Pockets of brittle silver are found and the ore body shows up stronger and better than ever.

IDAHO.

SILVER BAR.—Idaho *World*, Nov. 20: James Monroe took out 13 tons of ore this fall from the Silver Chief mine, at Banner, and had it milled by the Elmira Company at their mill. The 13 tons produced a bar worth over $1,400. This is an extraordinarily large yield, and is a fair milling test of what the Silver Chief will do. Jim intends to take the bar to Joliet, Ill., as a specimen of Idaho silver.

KETCHUM SAMPLING WORKS.—Idaho *Keystone*, Nov. 29: In a few days more the jar of machinery will herald the fact that the Ketchum sampling mill is ready for business. The project has been in mind for some time, and should meet with the success it deserves. Mr. J. J. Taylor was the projecter of the scheme and owing to his efforts outside capital has been induced to take hold of the matter with the result that the mill will soon be ready for business. Mr. Taylor will be the general manager, and is both capable and efficient for the position.

IN AND AROUND BULLION.—Wood River *Times*, Nov. 26: There are between 25 and 30 men employed by the Mayflower Company at present, and about 20 by the Wood River Company. The Bates & Boyd group employs about a dozen, the Bay State group the same, the Red Elephant, O. K., Valley View and Mountain View about 30 altogether. The Narrow Gauge group employs a dozen, the Idahoan the same number, and various other claims about 20. This is about the maximum number of men at work in and around Bullion at present. Within a month or two, however, this number will probably be nearly doubled. The Idahoan will doubtless change hands, when a large number of men will be at once set to work, while the force on the Mayflower will probably be doubled, and that of the Wood River Company and the Eureka mine will also be increased. But no very large or general increase need be looked for until next spring.

MONTANA.

DEVELOPMENTS.—*Inter-Mountain*, Nov. 25: A feature of the mining industry that is exciting considerable comment is the large number of claims that have recently developed sufficient value to warrant the putting up of hoisting plants. In most cases these works are small, it is true, but they are, it is to be hoped, the fore-runners of more extended affairs, and in their unpretentious way serve to augment the prosperity of the camp. In answer to the increased demand for this class of machinery, some of the largest manufacturers have found it to their advantage to either locate in our midst with extensive stocks or send representatives to look after their interests. All of which may be set down as evidence of increased prosperity and steps onward in a career that is putting Butte in the front rank of mineral production and attracting hither the capital that is needed to more successfully cope with the extraction and reduction problems.

LEXINGTON.—At the Lexington but little of note has occurred since our last report. From all the levels good ore is being extracted in such quantities as to keep up the reserves for the mill. On the 650-ft level developments are still in progress. At the mill everything is running smoothly, and the satisfactory bullion record is kept up to the usual amount.

MAGNA CHARTA.—In the Magna Charta a fine strike has been made during the past week. In the west drift of the 600-ft level, on the north vein, a ledge having a pay streak three ft in width, assaying 74 ounces, has been encountered. At the mills there is nothing new to report, the stamps continuing to grind out the usual amount of ore daily.

MOULTON.—Developments in the Moulton continue to be of the usual satisfactory character and the regularity of the bullion shipments presage a continuity of the excellent record achieved by this property in the three years of its development. The almost unparalleled record achieved by this company is deserving of more than passing mention. Hardly three years ago the mill was first started up. At that time, as will be remembered by our citizens and the stockholders, the concern was somewhat in debt, but by most skillful management and strict adherence to business principles, the mine has paid off its debt and is now found to be in position to pay its third dividend.

POSER.—Sinking to the depth of 160 ft has been accomplished, and from this point levels on a body of ore 12 ft in width are now being run to the east and west. Shipments to the mill are being made of about 150 tons per month of assorted rock, assaying about 60 ounces in silver.

NOTES.—The Black Rock, a claim lying east of the Poser, has been leased to a party of Cornishmen, who are now prosecuting development, and from indications it would seem that they are destined to strike it rich. The Silver Safe has indulged in new hoisting works, and is producing some very rich ore. In the Rock Island a full force of men are at work on a 5-ft vein of ore, assaying from 40 to 70 ounces in silver. At the Argonaut, situated north of the Moulton a short distance, they have struck some very rich ore. The Pollock recently shipped 64 tons of ore to the mill, averaging 54 ounces in silver. The Maria, a claim north of the Moulton, worked by the Lamore brothers, is producing some very good ore.

NEW MEXICO.

NOTES.—Silver City *Enterprise*, Nov. 29: Bear mountain properties are attracting capitalists with an object to obtain interests in the camp. Regular bullion shipments continue from the Mimbres well. The output during the past six months will make an excellent showing but not such as the first six months of 1883, we predict. Keith & Co. are working a small force of men on their Dove mine at Malone and are rapidly taking out some of the richest ore ever found in the camp. It is very rich black sulphurets intermixed with horn silver. Within the past few days we are reliably informed, that an important strike has been made in the seventh level of the Black Hawk mine. The ore is of the characteristic high grade for which the mine has become famous and gives assurance of being in quantity. Good ore was also encountered at the fourth level that gives great promise for the future of the mine. Capitalists and mining men seeking properties in this section at present are very unreasonable and in almost every instance endeavor to obtain mines that they think will pay them out on their investment in 60 or 90 days. It is true, there are a few such properties in this county but they are mighty few. With every foot of work performed in the new camp of Gold Hill in the Burros, the claims show up to a better advantage. The ledges are not so large as was at first represented, but the mineral is there in paying quantities and of a high grade in many places. The district is a larger one than was at first supposed, and is the best field in the Territory to-day to prospect. Within the past ten days several important finds are reported. The Young Man mine at Gold Gulch has been bonded by the California Combination company of San Francisco, which is reported as representing a large amount of capital. The figure set upon the property is $100,000 and the bond is to run four months. The claim is comparatively a prospect, having been discovered last spring by A. K. Rutter. The ore bodies were found in most cases to be very large and a greater portion of it was high grade. An assorted lot of 14 tons gave a gross return of $275 per ton from the Socorro smelter. We are informed by Messrs. Rutter and Mikesell that it is the intention of the company to place 50 men at work within the coming month and that if the property proves satisfactory, the company purchasing intends erecting a 40-stamp mill in Thompson canyon near the claim. The mill is already the property of the company and has been in operation in California for several months at a loss, in consequence of which they are endeavoring to obtain a property which will employ this plant, which is said to have cost $140,000 thus far. There are many other valuable claims adjacent to the Young Man mine, which give promise for the future, and whose owners are steadily developing and shipping the ore. A small amount of money judiciously spent would make a wonderful showing in this district. It is reported that the company have other prospects in view, which they will probably purchase.

UTAH.

REVIEW.—Salt Lake *Tribune*, Nov. 24: The week has seen pleasant weather throughout, and fair activity in the handling of the metal. The shipments from the city for the week ending Saturday, Nov. 22nd, inclusive, were 44 cars of bullion, 41 cars of ore, and 5 cars of lead, a total of 90 cars. The receipts of the metals in this city for the week ending Nov. 26th, inclusive, were $120,332 61 in bullion, and $13,990 in ore, a total of $134,322.61. The Horn Silver shipments for the week amounted to 20 cars of bullion valued at 56c,000; bringing the total shipments of the year up to to $2 358,000. The Ontario shipped in during the week amounted to 41 cars of bullion, $28,644.90, raising the total shipment of this company for the year to $1,522,061.85. The Christy sent up from Silver Reef 3 bars of silver during the week, $5,075. The product of the Hanauer smelter for the week was 8 cars of bullion, $16,100.

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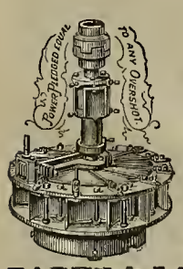

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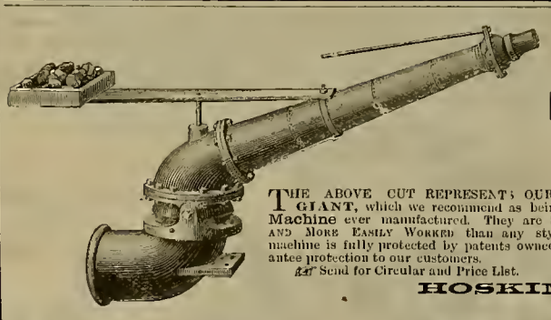

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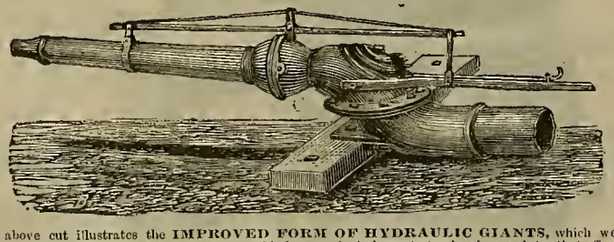

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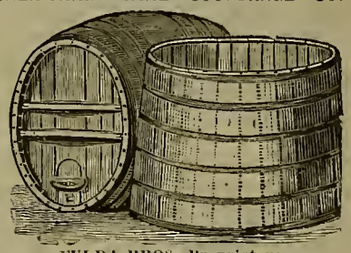

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From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.]

FOR WEEK ENDING NOVEMBER 25, 1884.

308,406.—LIME KODDERY FRAME—Izora Elder, S. F.

308,410.—AMALGAMATOR—Otto Hanson Sacto.

308,411.—HOOF KEEL—Harding & Hall, S. F.

308,413.—SPUR—Johan Kruno Coffey's Cove Cal.

308,417.—BELT GUIDE—J. E. Layng, S. F.

308,427.—BRUSH—B. Normandin, S. F.

308,433.—GARMENT FASTENER—A. V. Smith, S. F.

308,434.—STONE DRILL—Thos. M. Yerkes, S. F.

Mining Share Market.

The sales in the mining stock market are only moderate, and there have been few fluctuations of special importance. At the north end of the Comstock work is progressing steadily but as yet without any result to the way of new developments. The west crosscut on the 3000 level of the Sierra Nevada has as yet found nothing better than was shown in the drift.

At the 3300 level of the deep winze the diamond drill is still being run to the southwest. It is passing through alternate strata of hard and soft rock. Some of the rock has been so hard and tough as to twist the diamonds out of the head of the drill, thus causing trouble and delay. The drill hole has not tapped any large flow of water. The rock drilled through is vein material. The vein is of great width at this point, and the west wall lies far beyond the point reached by the west or either of the westerly drill holes.

At Gold Hill the leading mines are extracting and shipping to mills on the river about the usual amount of low-grade ore.

At the Alta and Benton they are fast being flooded out. Undoubtedly the water with which they are battling is connected with that which has for so long flooded the lower levels of the Jacket, Crown Point, Belcher and Silver Hill. They have lowered the water in the latter mine as is shown by the pressure gauge 230 feet, and in the others about 300 feet. Were the Silver Hill, Belcher and Yellow Jacket free now to turn to and start up their pumps, it would be an easy matter to drain the whole line of flooded mines.

The following mines had cash on hand Dec. 1st: Alta $9,241.75; Andes, $5,229.10; Argenta, $4,84-; Alpha Con., $7,180.49; Bulwer, $2,518.76; Bodie Con., $144,396.86; Best & Belcher, $2,317.84; Benton Con., $11,156.12; Belcher, $15,383.38; Crown Point $22,860.36; Con. California and Virginia, $2,449.41; Exchequer, $4,244.59; Gould & Curry, $46,067.07; Mono, $21,809.79; Martin White, $4,230.50; Navajo, $92,668.88; Occidental, $2,943.88; Potosi, $11,051.97; Sierra Nevada, $39,398.96; Savage, $4,807.23. Utah, $4,557.42.

The following mines had indebtedness on Dec. 1st: Chollar, $2,788; Grand Prize towerdraft, $39,069.42; Hale & Norcross, $31,132.54; Lady Washington Con., $5,544.68; Mexican, $4,209.96; Ophir, $5,994.78; Standard, $2,098.90; Union Con. $13,466.32.

Bullion Shipments.

Manhattan, Nov. 27 $10,421; from Butte, Montana week ending Nov. 21, $163,360; Hanauer 25, $3,700; Crescent, 25, $2,670; Ontario, 25, $10,460; Horn Silver, 25, $18,000; Hanauer, 26, $4,300; Crescent 26, $2,150; Queen of the Hills, 26, $1,420; Horn Silver, 26, $9,000; Christy, 26, $1,775; Vienna, 26, $1,670; Day, 27, $4,172; Horn Silver, 27, $9,000; Horn Silver 29, $9,000; Ontario, 29, $20,189; Hanauer, 29, $7,600; Stormont, 29, $3,250; Nevada, 29, $3,500; Day, 30, $11,058; Hanauer, 30, $2,450; Crescent, 30, $2,490; Horn Silver, 30, $12,000; Christy, 30, $1,600; Minnie Moore, 30, $4,100; Bonanza King, 22, $7,528; Bodie, 24, $18,997; Navajo, 24, $14,000 Christy, 30, $10,211. The banks of Salt Lake City report the receipt for the week ending November 26th, inclusive, of $120,332.61 in bullion and $13,900 in ore; a total of $134,322.61.

Agents' Promises.

We do not intend that the agents for this paper shall make any promises they are not authorized or able to fulfill; and such as they do offer, we desire to have properly carried out. To this end, we would thank our patrons to inform the office personally should there seem to be any neglect at any time in this direction, as we have no other way of knowing it if an agent, or correspondent, should wilfully or by oversight neglect to fulfil a promise.

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 119 and 121 First street, a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below costs, and parties who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. References as to above can be had upon applying to this office.

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Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Nov 15.		WEEK ENDING Nov 20.		WEEK ENDING Nov 27		WEEK ENDING Dec. 4	
Alpha	.95	1.00	.65	.90	.77	.80	.75	.95
Alta	.75	1.20	.55	.75	.90	.55	.25	.35
Andes		30		.25	.20	.35		.25
Argenta						.10		
Belcher	.70	1.45	.45	.65			.55	.65
Gelding								
Best & Belcher	1.30	1.70	1.00	1.30	1.00	1 10	1.00	1.75
Bullion		.25	.15	.75			.15	.25
Bonanza King								
Belle Isle		.25	.25	.30				.30
Bodie Con	2.45	3.00	2.90	3.20	2.55	3.15	2.40	2.80
Benton	.20	.30	.15	.20	.10	.15		.10
Bodie Tunnel								
Bulwer	.55	.60	.40	.50		.40		.30
California	.15	.30				.10	.10	.15
Challenge								.15
Champion								
Chollar	2.30	2.30	1.35	1.75	1.70	1.90	1.70	2.90
Confidence		.70	.50	.65			.60	.70
Con. Imperial								
Con. Virginia	.15	.30	.10	.15		.10	.10	.15
Con. Pacific		.95	.90	.95	.90	.95		.95
Crown Point	1.00	1.05	.55	.80	.75	.80	.75	.90
Day		.75		.75		.75		
Eureka Con		3.00				2.90		2.75
Eureka Tunnel								
Exchequer		.15	.20	1.00	.15	.15	.15	.20
Grand Prize	.10	.15				.10	.05	.10
Gould & Curry	.90	1.00	.55	.75	.50	1.05	1.00	1.30
Goodshaw								
Hale & Norcross	2.85	4.00	2.25	2.85	2.60	2.95	2.90	3.25
Holmes			3.50	3.75		3.70		
Independence								
Julia								
Justice		.15		.10		.15		.15
Martin White								
Mono	1.30	1.55	1.30	1.50	.05	1.35	.05	1.00
Mexican	.65	1.00	.55	.70	.45	.60	.45	.65
Mt. Diablo	3.50	3.75		3.90			3.75	3.90
Northern Belle								
Navajo	3.75	3.95	3.00	3.55	3.2	3.25	2.75	3.25
North Belle Isle		.45		.40	.35	.40	.30	.40
Occidental	1.25	1.50	1.00	1.15		1.25		1.10
Ophir	.60	.85	.50	.60	.50	.55	.50	.60
Overman				.90				.90
Potosi	.90	1.15	.65	.95	.75	.90	.80	1.15
Final Con								
Savage	.95	1.45	.65	.90	.75	.85	.75	1.10
Seg. Belcher				.60				
Sierra Nevada	.60	1.00	.45	.65	.45	.90	1.00	1.20
Silver Hill				.90				
Silver King		1.13	4.75	5.00		5.25		
Scorpion		.45		.10		.10		.15
Syndicate	.45	.55		.45				.45
Tioga								
Union Con	.55	.90	.45	.55	.45	.50	.45	.60
Utah	.45	.55	.30	.40		.30	.70	.85
Yellow Jacket	1.50	1.75	.90	1.50	1.15	1 20	1.05	1.15

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Dec 4

200	Bodie		2.55@2.60
250	Bodie Con	2.70	
100	B. & Belcher	1.15	
200	B. & Belcher	1.05	
350	Bullion	25@30c	
2250	Con Va & Cal	10c	
200	Chollar	2.55@2.60	
150	Con Pacific	.95c	
850	Exchequer	15c	
340	Gould & Curry	1 25	
750	Hale & Nor	2.80@2.90	
100	Mexican	45c	
200	Mexican	1.15	
200	Ophir	60c	
500	Potosi	1.00	
250	Solid Silver	25c	
410	Sierra Nevada	.95c	
100	Savage	.90@95c	
400	Union	.35@40c	
100	Yellow Jacket	1 10	

AFTERNOON SESSION.

400	Alta	25@30c
400	Bodie	2.55@2.60
100	B. & Belcher	1.15
350	Bullion	25@30c
200	Belle Isle	.25c
50	Confidence	65c
250	Chollar	2.75
50	Eureka Con	2.80
430	Gould & Curry	1 35
300	Goodshaw	.05c
950	Hale & Nor	3.00
500	Independence	.15c
1100	Mono	1.00@1 05
110	Navajo	3.00
20	Ophir	50c
300	Potosi	1 05@1.10
100	Sierra Nevada	1.20
650	Savage	1.00
60	Union Con	.50c
350	Utah	.80c

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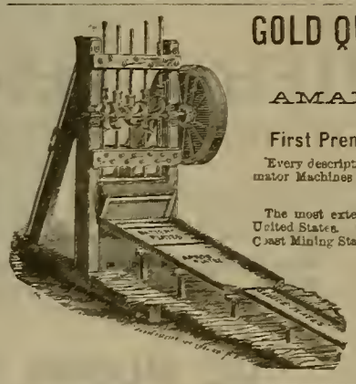

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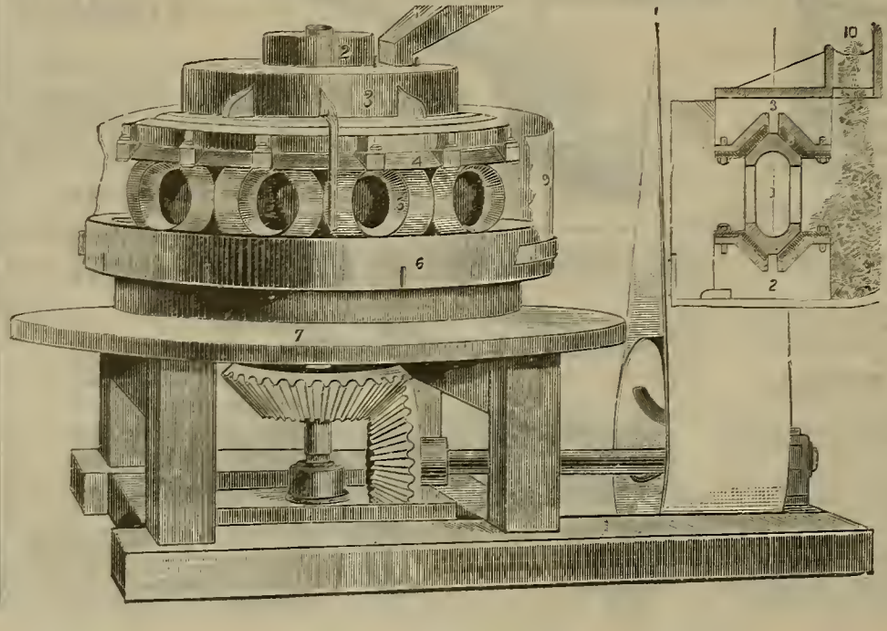

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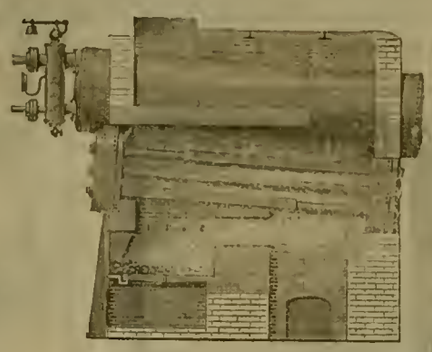

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Risdon Iron and Locomotive Works—Gentlemen: We have had one of your Heine Patent Safety Boilers in use for four months at our Borax Works, in Alameda. It does good work and gives perfect satisfaction. Yours truly,
(Signed) WM. T. COLEMAN & CO.

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ASSESSMENTS.

COMPANY	LOCA	S	NO	AMT.	LEVIED	DELINQ'NT	SALE	SECRETARY.	PLACE OF BUSINESS
Butte Creek Hyd M Co	California		10..		Sept 23	Nov 6	Nov 29	R L Taylor	340 Montgomery st
Best & Belcher M Co	Nevada		31..	50	Nov 21	Dec 30	Jan 19	W Willis	309 Montgomery st
Champion M Co	California		17..	10	Nov 24	Dec 29	Jan 19	T Wetzel	327 Montgomery st
Con Argonaut M Co	California		8..	30	Dec 3	Jan 5	Jan 24	F B Latham	408 California st
Copper Mt Con M Co	California		1..	05	Dec 3	Jan 13	Feb 10	A L Perkins	310 Pine st
Cheddar M Co	Nevada		15..	50	Oct 29	Dec 2	Dec 23	C L McCoy	309 Montgomery st
Con Va & California M Co	Nevada		1..		Nov 7	Dec 13	Jan 3	A W Havens	302 Montgomery st
Crocker M Co	Arizona		1..		Oct 31	Dec 2	Dec 23	A Waterman	303 Montgomery st
Gould & Curry S M Co	Nevada		49..	50	Oct 25	Nov 29	Dec 22	A K Durbrow	309 Montgomery st
Grand Prize M Co	Nevada		17..	3	Nov 24	Dec 30	Jan 28	E M Hall	327 Pine st
Golden Fleece G M Co	California		34..	40	48	Oct 13	Nov 14	Dec 8	P Sedgwick	412 Sixth st
Indian Spring Drift M Co	California		1..	05	Nov 21	Dec 22	Jan 21	A F Paul	328 Montgomery st
Lamphire G M & M Co	California		1..	10	Oct 3	Nov 17	Dec 8	A Martin	526 Montgomery st
Lewis Con M Co	Arizona		5..	05	Nov 14	Dec 22	Jan 19	J W Pew	310 Pine st
Mayflower Gravel M Co	California		27..	10	Nov 29	Dec 24	Jan 12	J Morizio	328 Montgomery st
Marshall M Co	California		2..	10	Nov 6	Dec 15	Jan 5	A L Perkins	310 Pine st
Mexican S M Co	Nevada		28..	50	Nov 11	Dec 17	Jan 8	C E Elliott	303 Montgomery st
Ophir M Co	Nevada		48..	50	Nov 12	Dec 17	Jan 6	E B Holmes	303 Montgomery st
Rainbow M Co	California		12..	15	Oct 21	Dec 1	Dec 20	P F Marhardt	311 Montgomery st
Standard M Co	California		1..	25	Oct 17	Dec 1	Jan 5	W Willis	309 Montgomery st
Sierra Nevada S M Co	Nevada		80..	50	Oct 22	Nov 26	Dec 25	E L Parker	303 Montgomery st
Savage M Co	Nevada		81..	50	Nov 11	Dec 15	Jan 5	E B Holmes	303 Montgomery st
Utah S M Co	Nevada		51..	50	Oct 23	Nov 28	Dec 16	C C Pratt	309 Montgomery st
Union Con M Co	Nevada		28..	50	Nov 5	Dec 9	Dec 30	J M Buffington	309 California st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Gould & Curry M Co	Nevada	A K Durbrow	309 Montgomery st	Annual	Dec 1
Head Center & Tranquility M Co	Arizona	J W Pew	310 Pine st	Annual	Dec 5
Mount Diablo M Co	Nevada	B W Heath	318 Pine st	Annual	Dec 1

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	B L Burling	328 Montgomery st	50	Dec 5
Belcher Blue Gravel M Co	California	T Wetzel	322 Montgomery st	10	Oct 8
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Dec 13
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Nov 28
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Nov 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Nov 6

DELINQUENT NOTICE.

The Lamphire Gold Mine and Milling Company.—Location of principal place of business, Room 2, No. 526 Montgomery street, San Francisco, Cal. Location of works, Tuolumne Mining District, Tuolumne county, Cal.

NOTICE.—There are delinquent upon the following described stock, on account of Assessment (No. 1) levied on the third (3d) day of October, 1884, the several amounts set opposite the names of the respective shareholders, as follows:

NAME.	No. Certificate.	No. Shares.	Amount.
Martin, A., Trustee	6	33,320	$3,332 00
Davis, John A	7	9	99

And in accordance with law and an order of the Board of Directors, made on the third (3d) day of October, 1884, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at the office of the company, Room No. 2, No. 526 Montgomery street, San Francisco, Cal., on Monday the eighth (8th) day of December, 1884, at the hour of 12 o'clock noon, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

ADDISON MARTIN, Secretary.

OFFICE—No. 526 Montgomery St., Room 2, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Bodie Consolidated Mining Co.,

Room 62, Nevada Block, San Francisco, Nov. 20, 1884.

At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 18) of Fifty Cents per share was declared on the capital stock of the Company, payable Friday, December 5, 1884, at the office of Messrs. Laidlaw & Co., New York, only on stock issued from the Transfer Agency in that city, and at the San Francisco office only on stock issued here. Transfer books will close on Saturday, November 29, 1884, at 12 o'clock M.

B. L. BURLING, Ass't Sec'y.

ASSESSMENT NOTICE.

Gould and Curry Silver Mining Company.

ASSESSMENT No. 49.

Levied ..... October 25, 1884
Delinquent ..... November 29, 1884
Day of Sale ..... December 22, 1884
Amount ..... Fifty cents per share.

ALFRED K. DURBROW, Secretary.

OFFICE—Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

JOSHUA HENDY MACHINE WORKS,

Incorporated September 29, 1882.

Nos. 39 to 51 Fremont Street, - - - - - - - - - - San Francisco, Cal.

.....MANUFACTURERS OF.....

NEW and Dealers in SECOND-HAND BOILERS, ENGINES and MACHINERY

OF EVERY VARIETY.

Steam Pumps of all Makes,
CENTRIFUGAL PUMPS,
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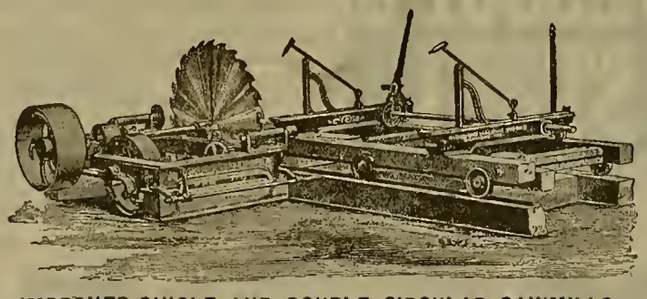
BLOWERS AND EXHAUST FANS.
LEATHER AND RUBBER
BELTING.



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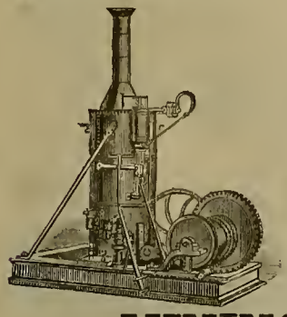
Etc., Etc.



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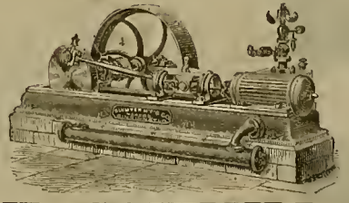
.. AND ..
Hoisting Engines
.. ...AND.....
BOILERS.



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First St., between Howard & Folsom, S. F.

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PREVENTS LEAD POISONING AND SALIVATION.

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FOR SAVING GOLD.

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KEATING & FAGAN, Prop's.

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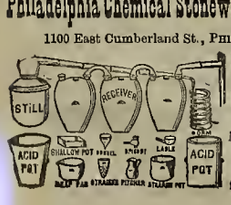

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Also Chemica Brick for Glover Tower.

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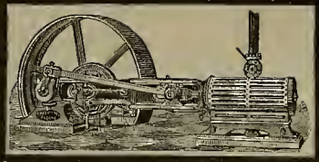
CLEVELAND OHIO

SEND FOR 150 PAGE ILLS CATALOGUE.



Awarded highest premiums at Cincinnati and Louisville Expositions of 1883, for "Best Automatic Engine." We will furnish anyone copies of the ORIGINAL ENTRIES of several engine builders who claim they were not competing with us. They all entered in the same class with us, and now by deceptive Circulars (one headed "Fact versus Falsehood,") attempt to mislead.

☞*No premiums were offered for Condensing Engines.*

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AG'TS DYER CANNON BALL QUARTZ MILL

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In Bond or Duty Paid.

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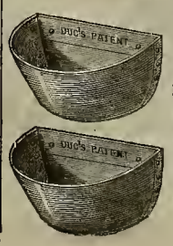

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Extra Strong and Very Durable.

Made of Best Charcoal Iron. Only One Seam. No Corners to Catch. Runs with Least Power.

☞BEST MINING BUCKET MADE.☜

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PRICES GREATLY REDUCED.

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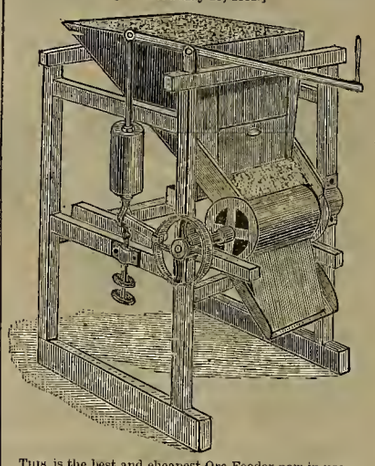
THE ROLLER ORE FEEDER

[Patented May 28, 1882.]



This is the best and cheapest Ore Feeder now in use. It has fewer parts, requires less power, is simpler in adjustment than any other. Feeds coarse ore or soft clay alike uniformly, under one or all the stamps in a battery, as required.

In the Bunker Hill Mill it has run continuously for two years, never having been out of order or costing a dollar for repairs.

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Engineers, Iron and Brass Founders.

Have for sale, second-hand, in good order:

HOISTING and PUMPING ENGINES, PUMPS, AIR COMPRESSORS, ROCK DRILLS, MILL ENGINES, BATTERIES, PANS, SETTLERS, BOILERS, HEAVY GEARS, SHAFTS, ROUND and FLAT STEEL CABLES, MINE and INCLINE CARS, CAGES, and BALING TANKS.

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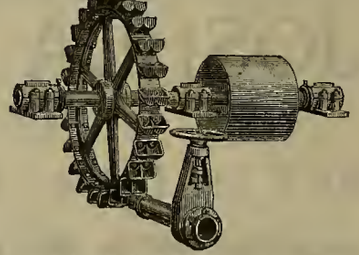

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On the 25th day of August, 1884, Judge Sabin, of the United States Court of Equity, decided the great infringement case of the Sa'amanda Felting Company of New York and Philadelphia vs. the EUREKA CEMENT, in favor of the EUREKA CEMENT. This decision is one of the most important that has been rendered for many years, because it gives Messrs. GOULD & HILL the unrestrained right to continue the manufacture of the BEST COVERING FOR STEAM BOILERS AND PIPES that is known to the world

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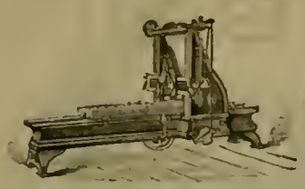

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200 to 10,000 Gallons a Minute.

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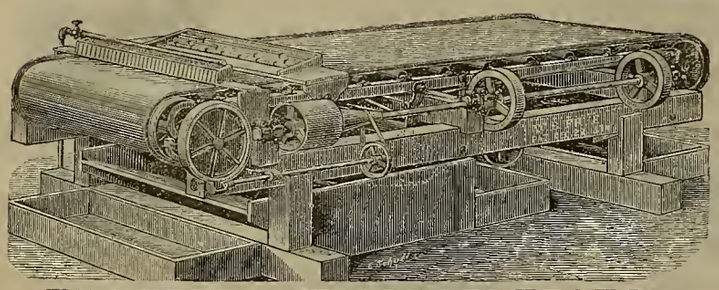
$1,000 CHALLENGE!



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OVER 1,000 ARE NOW IN USE. Saves from 40 to 100 per cent more than any other Concentrator. Concentrations are clean from the first working. The wear and tear are merely nominal. A machine can be seen in working order and ready to make tests at the Fulton Iron Works, No. 220 Fremont Street, San Francisco.

As the result of a suit East against an End-Shake Machine (the Embrey), similar to the Triumph, the Frue Vanning Machine Company owns the Embrey patent, and can put in the market an End-Shake Machine of earlier patent that will do as good work as the Triumph, and superior in construction and durability. There will be no risk of suit for infringement.

The Frue Vanning Machine Company warn the public that they claim and will prove the Triumph machine to be an infringement on patents owned by them.

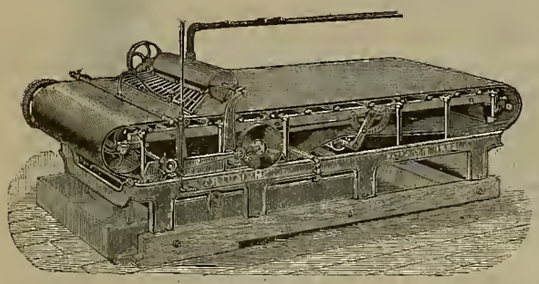
Protected by patents May 4, 1869, Dec. 22, 1874, Sept. 2, 1879, April 27, 1880, March 22, 1881, Feb. 20, 1883, Sept. 18, 1883. Patents applied for.

N. B.—We are and have been ready at any time to make a competitive trial against the Triumph, or any other Concentrator for stakes of $1,000.

ADAMS & CARTER, Agents Frue Vanning Machine Co.,

Room 7—No. 109 California Street, - - - SAN FRANCISCO, CAL.

$1,000 CHALLENGE ACCEPTED!



"THE" "TRIUMPH" ORE CONCENTRATOR.

PRICE, FIVE HUNDRED AND FIFTY DOLLARS ($550.00), F. O. B.

THE "TRIUMPH" TRIUMPHANT!

In a competitive trial recently had between two of the **"Triumph" Ore Concentrators** and the same number of **"Frue' Vanning Machines,** at the mill of the celebrated gold producing Original Empire Mill and Mining Company, in Grass Valley, Nevada County, Cal., the "Trimmphs" produced thirteen and fifteen one-hundredths (13.15) per cent more concentrations than did the "Frue" Vanners, during a run of twenty-four consecutive days, or a net gold coin result of $199.15, or $8.30 per day, in favor of the two "Triumph" Concentrators.

These returns do not include the value of the amalgam saved by the "Triumphs" during the test; which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarily saved, which is lost on the "Frue" Vanners.

This trial was conducted under the personal supervision of the Manager and Superintendent of that Company, in a strictly fair and impartial manner, and with the sole view of determining, in the interest of that Company, the merits and demerits of the respective machines by a thoroughly practical test. A relation of the course of procedure, a concise analysis of assays, and a tabulated statement of the net bullion results, with accurate deductions therefrom, will soon be published in Circular form.

The superiority of the present construction of the "Triumph" over the form originally introduced, together with the demonstrated results of the above, and other trials had with the "Frue" Vanners, induce us to and **we hereby accept the Challenge of $1,000,** flaunted by the Agents of the "Frue Vanning Machine Company," and hold ourselves in readiness to enter into a second competitive trial for that sum, at such place and upon such terms and conditions as may hereafter be mutually arranged.

We guarantee purchasers against all costs, expenses or charges incurred by reason of any infringements of any existing patents.

"Put up or shut up," and "Let the Best Machine win!"

JOSHUA HENDY MACHINE WORKS,

Nos. 39 to 51 Fremont St., San Francisco, Cal.

CHISHOLM'S IMPROVED PORTABLE —AND— STATIONRAY SAW MILLS

Patented Nov. 21, 1883.

Received the First Premium at the Mechanics' Fair

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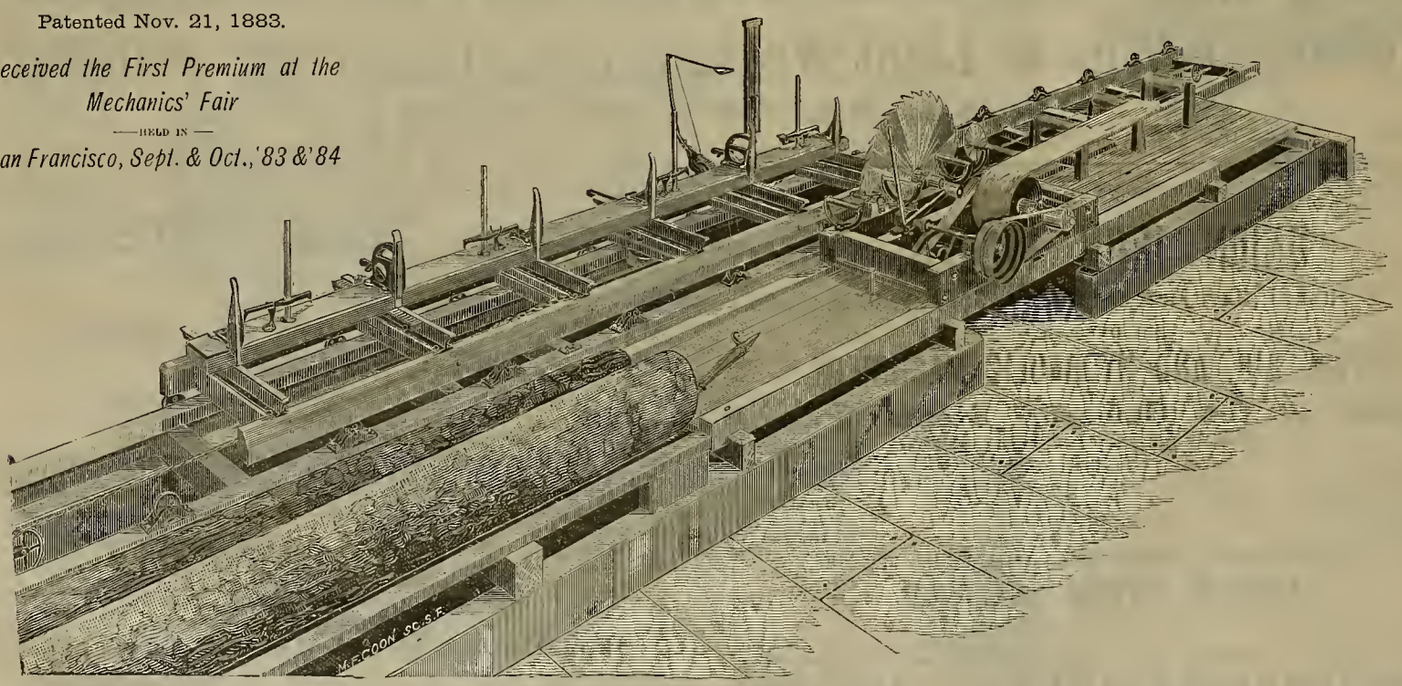
San Francisco, Sept. & Oct., '83 & '84



I have one of these Mills in constant operation at my works here, which can be seen at any time. ALL SIZES OF MILLS MANUFACTURED. Will cut from ten to fifty thousand feet per day. Please send for Descriptive Circular. Estimates furnished on application, for Boilers and Engines or Water Wheels to go with Saw Mills.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, DECEMBER 13, 1884.

VOLUME XLIX. Number 24.

Goodson's Ore Pulverizer.

D. Virgil Goodson, of Bodie, Mono county, in this State, has received, through the MINING AND SCIENTIFIC PRESS Patent Agency, a patent on an improved form of ore pulverizer, which is illustrated by the engraving on this page. Fig. 1 is a perspective view, and Fig. 2 is a radial vertical section through the cogged hand, base-frame, ore beds and screws, and an elevation of the rollers.

The base frame is plainly shown at A in Fig. 2. Near the outer rim is an annular groove forming the ore-bed, B, in which is the wearing-die, *b*.

Concentric with the bed, B, is the annular bed, C, having a die. The bed, C, is on a lower plane than the bed, B, and is separated from it by the intervening inclined surface, D, Fig. 2.

Upon the inner rim of the bed, B, are secured at intervals arms which support the series of screen-sections, E. These screens have preferably a large mesh.

Secured to the outer rim of bed, C, are inclined arms, which support the series of screen-sections, F. These continue the inclination of surface, D, and under them is an annular trough, F^2. Arms on the inner rim of said bed, C, support the series of screen-sections, E, both screens, F and G, having a finer mesh than screens E. The surface of the base, A, slopes downwardly from bed C, toward an annular trough, H, concentric with said bed, and having an outlet passing through the base to the outside, whereby the pulp or crushed ore may be discharged for subsequent treatment. The outer trough, F^2 also communicates with another outlet. The relative position of the screens is shown in both engravings.

J is a circular frame, consisting of a hub, radiating arms, *j*, and a rim, S. (See both Figs. 1 and 2.) The hub is pivoted by a vertical shaft passing through it into the center of base, A, and its rim is provided with underlying anti-friction rollers, which travel on the rim of the base outside of the bed, B.

Between each pair of arms, *j*, are secured bars, L. To the inner edge of the rim, S, are secured vertical guides, and to the adjacent sides of the outermost of bars, L, are secured similar guides.

M are heavy rollers or wheels resting on the bed, B. Their hubs are journaled in boxes fitted and adapted to slide up and down in guides.

N are heavy rollers or wheels resting on the bed, C. Their hubs are journaled in boxes, fitted and adapted to move vertically in guides, I, secured to the adjacent edges of adjacent bars, L. The rollers, N, are thicker than rollers, M.

O (in Fig. 1) are hoppers resting between and upon each pair of arms, and having their discharge ends extending downwardly. Each hopper has an oppositely extending and upwardly-inclined chute, P, joined together, as shown. Hung under each hopper is a tray, adapted to discharge into the outer bed (B.)

The main supply-hopper, which is suitably placed above, has a spout adapted to discharge into each hopper and chute as it is brought under it. Motion is imparted to its frame, J, by means of the cogged hand, S, on its rim, and the pinion on the main driving-shaft, but a belt may be used if found desirable. A shaking motion is given to the suspended trays for the purpose of producing an evenly-distributed discharge by means of a rod or arm on said trays. The other end of each arm is engaged by an annular-toothed or roughened surface, on the inner face of each roller, M.

The operation is as follows: The frame, J, is given a rotary motion in a horizontal plane, and the rollers are caused to travel around on

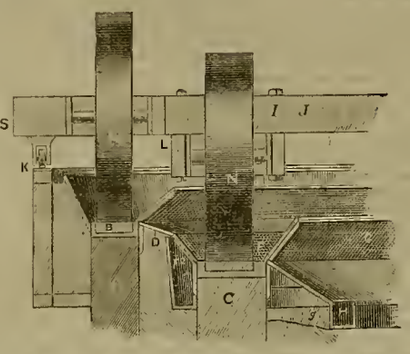

Fig. 2.—SECTIONAL VIEW OF ORE PULVERIZER.

the annular beds. Ore is supplied to each hopper and chute as it passes under the discharge-spout of the main supply-hopper, and each receives enough to last it one round.

The ore passes down on to the trays, and by

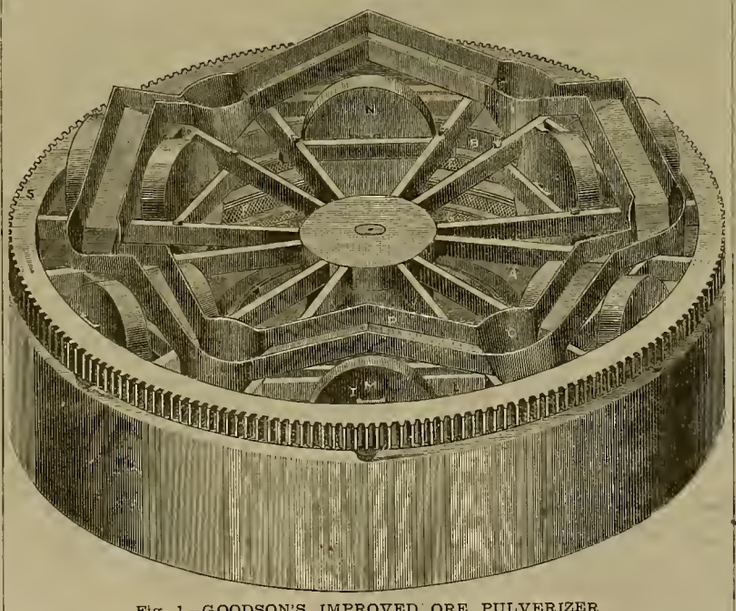

Fig. 1.—GOODSON'S IMPROVED ORE PULVERIZER.

them is shaken off into the outer bed, B, on which it is crushed by the rollers, M. The partially crushed ore or pulp, as it has now become, thence passes inwardly through the screens, E, and over the inclined surface, D, and screens, F, into the inner bed, C, in which it is pulverized very fine by the rollers, N. In passing over the screens, F, that portion of the ore which has been crushed sufficiently fine drops through said screens into the trough, F^2 and is thus disposed of, while the coarser ore passes into C.

Thence, after being crushed, it passes equally through the screens, F, G, into the trough, F^2 on one side, and over the surface on the other into the trough, H, and is discharged from both troughs through the discharge spout into suitable pans or receivers.

The coarser screens E are to permit the partially crushed sand to pass freely. The rollers being vertically-yielding, pass easily over the larger rocks without being impeded. They bear none of the weight of the frame, this office being performed by the anti-friction rollers, under the edge of the rim S. The inner set of rollers are thicker than the outer set, in order, by reason of greater surface, to pulverize the ore more thoroughly. More than two concentric beds or rollers may be added to this machine, as specially ordered, or the machine may be made as simple and light-running as possible, by decreasing the number of rollers.

Mr. Goodson states that he takes as perhaps the most practical dimensions for the bed, 30 feet in diameter for the outer bed, 6 feet in diameter for the rollers, 1 foot in thickness for the outer, and say 15 inches for the inner series of rollers. He claims that rollers thus made will readily pulverize one pound of ore per foot of the distance around the outer bed. The inner series of rollers only finish, of course, what the outer ones fail to make fine enough. Thus, at each revolution of the roller frame, each set of rollers will pulverize 90 pounds of ore; 6 sets will pulverize 540 pounds. He says that, say the frame is run at 5 revolutions per minute, which is moderate speed, there would be reduced 2,700 pounds per minute, or 81 tons per hour. But allowing that only one-half the amount or one-half pound per foot of the distance around the bed is pulverized, we have a wonderful result over the stamp battery process for the same outlay in putting in the plant.

To illustrate this Mr. Goodson says: "If it is allowed that each set of rollers will weigh 6 tons, that would be 36 tons to the 6 sets of rollers, and allow 10 tons for the 2 beds, and 4 tons for the other castings, etc., and we have 50 tons, or about the same as a 40-stamp battery, and we may say the expense of erecting will be about the same in each case. Besides, the rollers will require but little, if any more than half the power to run them than is required to run the stamps, while the latter will only reduce about 120 tons in 24 hours".

Idaho Mines.

We had a conversation this week with Mr. Thomas Murphy, who has been mining in Idaho for several years past. He is particularly interested in the Sawtooth region, where many good mines have been found and which he thinks is the coming mining country of prominence. He thinks this the best camp on the frontier for prospectors to work in. Mr. Murphy, with Florence McCarty, owns the Fulton mine, on Fulton mountain, in the Sawtooth mining district, Alturas county, Idaho. The ledge was struck in the tunnel a year ago last August, from five and a half to six feet in width. The tunnel was run in on the footwall 75 feet along the ledge, as far as a depth of 80 feet. Samples assayed in this city showed $558.09 per ton in silver and some gold.

The Mountain King Company has a 20 stamp mill which has been running for about a year, summer and winter. They have ore in sight which will last them two years. They employ about 175 men all the year round. The silver ore from this mine is free milling.

The railroad came in last year as far as Ketchum, within 40 miles of the mines referred to. There is a good road from the town of Sawtooth to within a mile of Fulton. There is plenty of wood and water in the district, and the summer climate is very good.

Mr. Murphy spoke also of Redfish Lake, which is at an altitude of 9,500 feet, in the Sawtooth mountains. They have sounded 500 feet, and found no bottom. The lake is about three miles long and two miles wide, with fine meadows around its margin. Many people from Wood river and neighboring region, go to the lake to camp and fish in summer. The waters contain an abundance of a peculiar red fish, from which the lake takes its name.

A Philadelphia company put up concentrating works within a mile of Fulton, last summer, and reduced the ore for $5 per ton. All the prospector has to do, is to pack up and send off his concentrates, and get his cash. The works are of great advantage to prospectors throughout that section, giving them an excellent chance to readily market their ores.

RECENT discoveries in the gold mining region of Georgia have revived the interest which was turned away by the California discoveries.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

The Wood River Region, Idaho.

A Sketch of its Principal Towns—A Glance at its Mineral Resources.

[From Our Special Correspondent.]

Idaho is one of the most irregularly shaped of all our Territories. As the territorial regions develop, and as certain portions are admitted as States, this irregularity will be corrected. The Salmon river, from the point in its northerly flow where it bends to the westward, would be a natural northern boundary for the future State, and after that curtailment it would still be a very empire in dimensions. At present the Territory has an area of 84,290 square miles, which is more than that of several of our Eastern States combined. One of its counties—Alturas—lying in the southern part of the Territory, has an area of nearly 20,000 square miles, making it larger than many of the important States of our Union. It is a little to the west of the center of this immense county where we find the Wood River region. There is no other part of Idaho which is at present attracting equal attention, or that is developing so rapidly, or that gives so much promise of future wealth and permanence.

The Wood River

Has its source near that of the Salmon river, but flows southwardly to the Snake river, while the Salmon takes an opposite direction. The Wood is a beautiful river, its waters clear as crystal, fed from melting snows or pure springs. It is not a large stream, but is of sufficient size to serve as a conduit for immense quantities of timber, which is floated down in the shape of logs from its headwaters, and caught in booms at different points, where saw-mills work it up for use in mines or cities. Its waters are well stocked with fish, and trout is served at hotel and restaurant tables with the same regularity as steak or chops. The river is rapid, and could furnish abundant water-power for hundreds of mills or factories. Above the point where the river enters on its southerly flow through the lava fields of the Snake river, it meanders through a beautiful, though rather narrow valley, the bottom-lands of which are susceptible of cultivation. The mountains tower up high and imposing on either side, and it is a pretty sight to look down into the valley from these surrounding hights. It is within these mountains that are found

The Mineral Belts

Which are causing the present developments in the Wood River mines. Little was done in these mines previous to 1880, at which time it was at the expense of a toilsome and wearisome journey by stage or private conveyance that this section of the Territory was reached. Now, one can ride in comfortable coaches by rail to the immediate locality of the mines, and the car-loads of valuable ore that are daily carried south are proof of the wisdom of railroad extension to this new and promising mineral region. The traveler from the East now reaches the Wood River country by way of the Oregon Short Line to Shoshone, from whence a branch of that road runs north into the valley in question. The traveler from the West takes the Utah & Northern R. R. at Ogden, goes to Pocatello, where the Short Line is intersected, and from thence proceeds as before indicated. The ride into the country now being described is monotonous and uninteresting. From Ogden northwardly to Pocatello there is considerable variety to the scenery—the first part of the journey being through a fine agricultural region in Utah, and this is succeeded by a diversified region of mountain and valley. But when once the

Lava Fields of the Snake River

Are reached, there follows the sameness of a semi-desert for hundreds of miles, and from early morning till late in the evening the train toils slowly through these plains overlaid with an early and deep flow of sterile lava. To the geologist this region might have great interest, as he could theorize en route as to the direction and extent and source of this great flow of molten rock, which has followed along the main valley, penetrated the diverging canyons, and covered to a considerable depth a region of territory which otherwise might have been as fruitful and productive as the Mississippi or Sacramento valleys. As it is, this flow is covered with only a thin layer of soil, which has naturally settled into depressions, having projecting knolls of uncovered rock at frequent intervals. Some specimens of this lava are interesting to examine, exhibiting in unmistakable manner the irregular and snake-like flow of a semi-molten mass. The first town of importance which is reached as we proceed northward is

Bellevue.

This is the oldest of the Wood River settlements. Its present population is about 1,500. Considerable mining is done in the mountains to the west, which is largely concentrated in a single gulch, close to its junction with the main valley. Here has sprung up the mining settlement of Broadford, which is, in reality, a suburb of Bellevue, though the inhabitants are striving hard for an independent corporate existence, and the establishment of a separate postoffice. Bellevue has a good business with surrounding regions, and ample competition in trade to insure fair prices to all customers. There are two or three good hotels in the place, the International, kept by Matt. McFall, being as good as there is in the Territory. The same gentleman has an extensive boarding-house and hotel at Broadford. There are several stores in Bellevue which carry large stocks of goods, and it would seem that reasonable wants can be as readily met here as at almost any city of importance in the country. The basis of support for the town is the mining industry which is immediately contiguous. In mentioning these mines, the first in importance, not only in this locality, but in the entire Wood River valley, is the

Minnie Moore Mine.

It is about a mile or so from the outskirts of Bellevue, on the opposite side of the river, and contributes largely to the working population of Broadford. It is the most extensively developed mine upon a belt or system which includes other principal mines of this locality. Recently there has been a transfer of the property to an English management, and the date of the purchase was the beginning of an era of energetic development. Extensive improvements are now being completed, and at the time of our visit a large force of carpenters were busy at work rearing structures to cover the machinery, which had already been placed in position and put at work. The works are at the mouth of the incline, from which the present supply of ore is raised, so that there is the greatest convenience in handling the product of the mine. Besides the steam hoisting works there is an extensive concentrating plant, which can easily handle 100 tons of second-class ore per day. The machinery is placed upon a natural grade of the side hill, and includes rock crusher, cornish rolls and 16 three compartment jigs, besides two slime-jigs; also an ore-dryer upon improved principles. Work by machinery underground is done by means of compressed air, supplied by an air-compressor above the surface. There is a hoisting engine above ground, and also one at the foot of the incline; a 40-horse power engine for the jigs, and another of 25-horse power that will be available as a relief engine in case of accident or during repairs to the former machine. It will thus be seen that the machinery is complete. It is also new and first-class. Sixteen men will be needed about the mill, and 80 are employed in the mine. At present extensive developments below are progressing, for the purpose of making available large ore bodies to supply the works with plenty of ore. The quality of ore in the Minnie Moore is variable, and at times large chimneys or pockets are struck which pan out remarkably well. A recent discovery of this kind is reported. C. B. Palmer, Esq., is superintendent of the mine; C. R. Hole, secretary, R. J. McPhee, foreman of mine, and Wm. B. Jewell, superintendent of jig room and of construction of works. The Minnie Moore is considered a fine property, and is one of the prides of Idaho.

Queen of the Hills.

This mine is in the hill facing Broadford and Bellevue, and its buildings are within plain sight from those towns. An inspection of the works gives to the visitor an impression at once that it is a well managed property, and one of value. Like the Minnie Moore, the mill, or concentrating works, are at the very mouth of the tunnel, and the ore cars of ths mine dump their freight at the foot of the rock-crushsr of the mill. The machinery of the latter is not as extensive as that of some other mines, but thsre is a trimness and thoroughness observable in every part, and few works that we have seen so impressed us with symmetrical unity as did those of the Queen. There are five three-compartment jigs, besides other necessary machinery, which can produce from 10 to 15 tons of concentrates per day from 40 or more tons of ore. The product of the mine is kept at one car load (14 tons) of first-class ore or of concentrates per day, each varying as circumstances may require. The ore and concentrates average 67 per cent lead, and carry from 85 to 100 ozs. silver to the ton. The product is shipped to Salt Lake, where most of the stock of the mine is held, under the corporate name of the Bellevue, Idaho, Mining Co. The superintendent of the mine is J. A. Lusk, Esq., of Bellevue. Louis Kettler is foreman. From the former we learned that developments in opening out the mine are being conducted all the time, that there are already in the mine 3,000 lineal feet of tunnels, levels and air connections; that the lower tunnel penetrates the hill to the extent of 800 feet, and that there are good prospects ahead for the permanence and value of the mine. Fifteen to twenty men are employed in the mill, and about 45 in the mine.

Other Mines near Bellevue.

The belt upon which the Minnie Moore is located is also the seat of operations for the following mines, which lie in the order named, beginning at the western development and following east: First, the Relief, where little work is done up to date. Next, the Minnie Moore, previously described. Next, the Michigan mine, where present operations are carried on under the superintendence of Mr. J. A. Lusk, of the Queen of the Hills, and where a tunnel has been run into the side of the hill, which has cut the ledge, along which the workmen have drifted for 200 feet. The quality of ore is similar to that in the Minnie Moore, and there is no doubt but this is a mine of value. Messrs. Millsr of Bellevue, and Scott and Packard of Salt Lake, are owners of the Michigan.

Next we find the Penobscot, on which there are some developments, and where work is now being prosecuted with energy. Our friend, Hon. V. S. Anderson, is part owner in this mine.

Next east of the Penobscot is the San Jose, still on the same belt, where it is reasonably supposed a similar character of ore will be found. And following the San Jose is the Cayuse, which, it is likely, will develop into a mine of the same description. This mineral belt is one of great promise, and upon its ultimate value, as operations in the way of prospecting, etc., are continued, much of the future prosperity of Bellevue depends.

The Gray copper mine, west of Queen of the Hills, and on the opposite side of the gulch from the Minnie Moore, is a promising property. Good ore is now being taken out and shipped, though in the limited quantity of 2 to 2½ tons per week. It carries 1000 ozs., silver to the ton, and averages nearly or quite 70 per cent lead. A tunnel is run into the hill some 170 feet, which strikes the ore vein 140 feet below the surface. As greater depth is attained; larger bodies of ore will probably be found. Developments are carried on by twelve men, under the superintendence of W. W. Forbes, Esq., the railroad station agent at Bellevue, assisted by Mr. Peter Fischer, foreman. This mine was discovered in January last.

The Overland mine is about a mile above the Minnie Moore. It has been a producing mine for two years, although much of the past work has been in the nature of development. The shaft penetrates a depth of 220 feet. The ore which is now being shipped, runs at least, 65 per cent lead, and contains about 120 ozs. silver to the ton. The mine is the property of the Overland Mining Company of Salt Lake; J. A. Luck, Esq., is the superintendent.

Further description of this mining region will appear in the PRESS next week.

Deadwood, Trinity County.

EDITORS PRESS:—In my last communication to your paper I gave you an outline of the mining being prosecuted in this camp. In that article I stated that we are located in the eastern part of Trinity county. Crossing over the divide from the mines I described, we come to Shasta county—French Gulch Mining District. This camp is one of the oldest in the State, having been discovered in '49, and yielded placer gold in abundance. A few of the old settlers who still live there say it was one of the richest mining camps in the State, but, like all other camps of early days, it is now almost worked out. The town of French Gulch is still about the liveliest in Northern California. Its population is about 600. It supports two stores doing general merchandise business, two hotels, saloons, etc. As early as '52, quartz mining has been prosecuted in this district. In the above year the Washington gold mine was discovered and incorporated by Mr. John Souter and others, the above mentioned being still the principal owner. It was worked successfully for several years, the ledge being exceedingly rich at the surface. According to the company's statement, it paid $500 dividends.

They had a 22-stamp mill which is still in good preservation, but used no concentrators, so that like in Virginia City in the early days of quartz mining, this simple process did not save all the gold it contained. Recently the company have started up the mill upon the old tailings and they are yielding $10 per ton. Through the courtesy of the owner I went through the mine and have been really surprised at its magnitude. After the first level had been worked out they started a tunnel further down the hill which tapped it at the depth of 200 feet from the old workings. The ledge averages from six to twelve feet wide and in some places it is a regular bonanza, they having neither found foot nor hanging wall. The tunnel runs along the ledge at least 150 feet and still the chute holds out. All the rock extracted from this level paid $8 per ton, but in those days it would not pay to work it. The rock is rich in galena sulphurets, the average assay being $200 per ton. All work is suspended now on the mine except where they are working out a rich streak of quartz running from the main vein which works $200 per ton. This statement in regard to the property might seem somewhat incredible, but any one who disbelieves it can come and see for themselves, as it is the policy of your correspondent who has been in every mining excitement from Pioche to Mexico to advocate legitimate mining, to tell about things as they really exist, as booming up a mining camp in his opinion is a detriment to it.

Another mine adjoining the Washington is the Franklin. It is owned by Mr. Souter who controls the Washington. This was also worked years ago. The ledge was small but very rich. Recently he has run a tunnel in the hill and struck a small vein which mills $300 per ton. Another mine called the Niagara, owned by William F. Coleman & Co., is a fine property. They have a cannon ball mill on this mine. It is paying handsomely, and at present are erecting a ten-stamp mill. Several other mines are working around here, one of the most prominent being the Brunswick Mining Co. They also have got a paying ledge and are now fixing to erect a cannon ball mill. Wood and water in this district is plentiful, we have got a mineral belt here which is simply surprising, and with a little more attention attracted towards it by prospectors and capitalists we shall yet produce more bullion than any mining camp in California.

P. F. MCCARTHY.

Fracture of Glass Tubes.

[Written for the PRESS.]

At a late meeting of the Academy of Sciences in this city, Prof. Davidson mentioned the experiment of the fracture of a glass tube (water-gauge for steam boiler) by the contact of a small brass wire with the inside of the tube. As I have endeavored for two years to investigate this phenomena, I will give the result of my observations, admitting frankly that I have not succeeded yet in demonstrating the cause of the fracture of the tube. Faraday assumes that glass consists of particles conductive (of electricity) in themselves, but insulated as respects each other (Faraday's *Experimental Researches in Electricity*, Vol. II, p. 272).

In a note to Par. 3151, Vol. III, p. 359, Faraday states: "When bismuth is soldered into the circuit, it requires to be left a long time before it is used for experiments, and should then be covered up and the loop handled with great care, otherwise thermo-currents are produced. For an hour or two after soldering it generates electrical currents, which appear at the galvanometer very irregularly, being probably due to internal molecular changes, which occur from time to time until the whole has acquired a permanent state of equilibrium." The *metal* referred to here as composing the circuit was *copper* wire. Faraday states that bismuth and glass are among the diamagnetic bodies, *i. e.*, those whose particles appear to become polarized in all directions; for a mass, when experimented upon so as to ascertain its inductive capacity in three or more directions (1690), gives no indication of a difference. Now, as the particles are fixed in the mass, and as the direction of the induction through them must change with its change, relative to the mass, the constant effect indicates that they can be polarized electrically in any direction. This accords with the view already taken of each particle, as a whole, being a conductor (1639), and, as an experimental fact, helps to confirm that view (Vol. I, p. 538). Tyndall refers to the lengthening of an iron bar when subjected to magnetic action, and says:—

"We may regard a bar of iron as made up of particles united by the force of cohesion, but still to some extent distinct. When iron is broken we see crystalline facets on the surface of the fracture. In fact the bar is composed of minute crystals of irregular shape. These when the bar is magnetized, try to set their longest dimensions parallel to the direction of magnetization, that is to say, in the direction of the bar itself. They succeed in this effort to a slight extent, and thus produce the minute and temporary lengthening of the bar. This is the explanation of De la Rive. It is, I think, as true as it is acute." ('Notes on Electricity,' p. 137.) Faraday proved that when a conductor moves *along* the lines of force no induced currents appear; but that when it moves *across* the lines of force such currents are generated. Becqueres considers that "polarity may in certain cases occur transverse to the length, and so produce results which others explain by reverse polarity." Ampere's view of polarity is, "that there are no magnetic fluids, but that closed currents of electricity can exist round particles of matter (or round masses), and that the known experimental difference on the opposite sides of these currents, shown by attraction and repulsion of other currents constitutes polarity." As the wire used in these experiments, which caused the fracture of glass tubes, was only one-sixth the internal diameter of the tubes, and only passed gently along the surface and then withdrawn, leaving the tube without the slightest perceptible sign of mechanical injury, the *subsequent dynamic effect* is the puzzle which remains to be solved. If the glass were even cut by a diamond, some mechanical force would be required to separate the tube at the weakened portion.

Brass is an alloy of copper and zinc, usually one-third zinc, and these metals are the two used to generate galvanic batteries. A series of experiments with different metals would prove interesting in noting the action of each on the glass tubes. The late Dr. Gibbons of Alameda said to me when the experiment of breaking the glass tube with brass wire was shown to him, referring to the punishment of children for the breaking of lamp chimneys and other glass tubes: "Many a child must have been spanked that did not deserve it."

As I think what has been described by Faraday of the molecular action of bismuth when connected with copper wire gives a clue for investigating the fracture of the water gauge when touched by brass wire, I offer it for what it may be worth:

I may say that in all the experiments of the fracture of glass tubes, by the passing of a small brass wire through the tube (over thirty), all were broken in from five minutes to five hours. The fractures show curvilinear lines across the lines of checks, produced, I think, by the annealing of the glass. The uniformity of these fractures suggests similar action of the force, causing the separation of the parts.

E. E. CHEVER.

MECHANICAL PROGRESS.

Does Vibration Affect the Balance of Machines?

A machine is said to be in balance when it moves harmoniously and without visible vibration, but this occurs only at certain speeds. That is to say, a machine balanced for one velocity will be out of balance at others. The causes of this is obscure, aside from centrifugal disturbance, and many good observers confess their inability to discover it.

The relative velocities of moving parts of a machine remain the same at all speeds, but the relative vibrations do not. At certain velocities the connecting rod of a steam engine transmits the power without vibration or jar, but urged faster it trembles visibly.

These vibrations do not occur in equal times, but are greater or less according as the rod is approaching or leaving the center, and when it is pushing the load or pulling it. Circumstances also affect the vibration. This want of synchronism affects the balance, in that it transfers the jar of the vibration to the moving parts in unequal times. Vibration is not a force, but is an action caused by it, and is undoubtedly a disturbance to harmonious motion.

Again, it is an oft-stated point that a reciprocating mass cannot be balanced by a rotating mass. If this be true, what becomes of the notorious fact that engines of all kinds move in equal times as far as we can see? They do not show any want of balance, though cast loose from fastenings, and held down only by their weight. An engine out of balance should give evidence of it by horizontal motion (supposing it to be a horizontal engine) of the bed-plate on its supports. Engines, when run at certain velocities, under such circumstances, sway the bed-plates to and fro, but at higher speeds remain stationary. What has counteracted this tendency when they remain motionless? Has not vibration entered into the question, and by its infinitesimal swayings of masses—like the beats of a pendulum—acted as a balance?

Our argument is for and against; we do not know what causes the disturbances and erratic action mentioned, but it would seem that the vibration of masses of metal at certain velocities may affect the balance of machines in a marked degree. We do not allude to mere tremor, but to visible movements. Even the former may have its influence when large masses are disturbed.—*Mechanical News.*

AMERICAN EDGE TOOLS, ETC.—The United States has a large export trade in edge tools, and fully two-thirds of the axes made in the town of East Douglas, Mass., are exported. A recent report from the Fiji Islands contains the statement that axes, hatchets, saws, hammers, chisels, augers, adzes, etc., are largely supplied from American factories. The American axe is the only kind a Fijian will use. He likes it for its lightness, keenness and temper; and so familiar is he with its specialties of workmanship, that it would be no easy task to impose a spurious one upon him. He, however, will not, if he can help it, go beyond $2,00 for a full-sized axe. Fifteen and eighteen-inch knives, strongly and ornamentally riveted to wooden handles, are a great article of trade. Every adult male Fijian is the possessor of one such knife; it is indispensable to him in weeding, clearing, and gathering his crops of cocoanuts, bread-fruit, bananas, pines, etc. The articles enumerated above are absolute necessaries on all plantations; and in nearly every house a few useful tools are kept. Lending, losing, and climatic damage are circumstances which help create a brisk demand for all hardware goods.

Galvanized buckets and tubs, anchors and chains, ship and boat fittings, steel screws and wire nails, all kitchen utensils and housekeepers' conveniences, are goods that enter largely into the local trade.

THE STEAM VALVE AND THE TEMPERATURE OF FEED WATER.—Very little additional power is gained in any engine by allowing the steam valve to open at over half stroke, and much less is lost in the crank and by dead centers than is generally supposed. From the above suggestion, the necessary failure of engines, when expected to yield the full boiler pressure power, in actual use is made quite apparent. If, besides amply for friction, a further allowance of twenty-five or thirty per cent is made for the governor and for a reserve, sufficient power in engines will generally be provided. The omission to do this has caused many advertisements of "a good second-hand engine for sale, having been replaced by a larger one." Inattention to the temperature of feed water for boilers is entirely too common. When the escape steam of the engine can be brought into water heaters, no water should be supplied to boilers at much less than boiling heat. A heater that does not furnish it and a pump that fails to force it in at that heat should be thrown out at once.

HOW TO FASTEN LEATHER BELTS LOOSENED BY DAMPNESS.—When a leather belt has been slightly injured by rain or by being wet in any other manner, it should be dried as much as possible, and laps that may have started can be fastened by a little cement composed of equal proportions of good glue and Prussian gelatine dissolved in water, and cooked in a tin vessel set into a larger one containing water. The vessel containing the cement should not be allowed to set quite on the bottom. Cook until quite thick and ropy; then work into the places where the laps are started with a knife; then hammer the belt until dry, and a few pegs may be used, which can be obtained from any local shoemaker. Cut the pegs off a little from the surface of the belt on the reverse side, and hammer them down on a flat iron, anvil or lapstone.

TO COMPETE WITH BESSEMER.—A syndicate has been formed, with headquarters at Reading, Pa., for the purpose of experimenting and controlling a new process of manufacturing steel, which is to compete with the Bessemer or English process, and the expectation is that it will take the place of forged or rolled iron in the manufacture of different articles. The patentee claims that he can manufacture steel much cheaper than it is done at present. Steel ingots were sent from Bellefonte to the different members of the syndicate, and tested in the manufacture of different articles with satisfactory results. At the McIlvain boiler-plate mill, in Reading, specimens of this kind of steel were rolled, bent, twisted and punched the same as iron. It is said that in rolling this steel from the ingot no blisters form, as is often the case in rolling iron, and that in this respect, as well as the quality and character of the metal, it is better. The "Henderson" is an open hearth steel, while the Bessemer is not. This new kind of steel is said to be more pliable and more easily worked than the Bessemer steel, while it is as tough, and the expectation is that it will take the place of hammered and rolled iron altogether. For instance, if it is found to answer the purpose, the McIlvains will roll it from the solid ingots into plates for steam boilers, water tanks, etc. The E. & G. Brooke Iron Company will use it in manufacturing nails, and other members of the syndicate will use it for different purposes.

AN ENGLISHMAN'S OPINION OF AMERICAN WORKMEN.—Mr. Malineaux, a prominent iron-master of England, who is now on a tour of observation among the ships of this country says: The object of his visit to this country was one of curiosity and pleasure combined with a desire to examine into and study the methods of Americans, not so much in the manufacture of iron and steel, as their modes of conducting all kinds of business and their ways of living. He thinks the people of this country are a stirring set. All seem to be on a rush somewhere or other and for some object. The American takes everything as a business, and even his pleasures are regarded in that light, per custom and habit. They do not enjoy the pleasures of life the same as Englishmen and other nationalities. As to the iron trade, he reports it dull in the Mother Country, but hopes for better times in the not far distant future. On the politics or tariff policy of this land he says but little, but has expressed the opinion that our people are as able to take care of themselves in the manufacturing line as any country in Europe.

THE following is said to form a good enamel for cast iron, wrought iron, or steel, and we are informed that it will not crack on being subjected to moderate changes of temperature. When an opaque enamel is required, let us suppose as a basis for vitrified photographs, about 8 parts of oxide of tin should be added. Take about 125 parts (by weight) of ordinary flint glass fragments, 20 parts of carbonate of soda, and 12 parts of boracic acid, and melt. Pour the fused mass out on some cold surface, as of stone or metal, and pulverize when cooled off. Make a mixture of this powder with silicate of soda of 50° R. With this coat the metal is to be glazed, and heat in a muffle or other furnace until it is fused.

PRESSED GLASS IN ARCHITECTURE.—It is stated that pressed glass is turned out in the Siemens works that is as hard and tough as cast iron. It is far lighter and not affected by temperature, etc. It is intended to make out of this hard crystal, street lamp-posts, stairs, gas and water pipes. It is thought these articles can be made thirty per cent cheaper than in cast iron, but will not of course, be so heavy.

A VERY important thing in wall painting is to have a good, sound, smooth surface to work upon. Cracks and other blemishes must be filled up and the wall thoroughly sand-papered, to make it even and smooth. Wrap the sand-paper around a flat piece of cork. Give a coat of patent size, and when dry rub smooth again. Then mix the paint with gold size.

AMERICAN AXES IN EGYPT.—It is stated, on English authority that the British Government have ordered from this country 5,000 American felling axes, for service in the army, on the upper Nile. The pattern is said to be precisely the same as that used by the Premier in the celebrated act of felling a tree, ably performed some years since.

A VARNISH has been patented in Germany for foundry patterns and machinery which it is claimed dries as soon as put on and gives patterns a smooth surface, thus insuring an easy slip out of the mould. It also prevents the pattern from warping, shrinking or swelling, and is quite impervious to moisture.

THE AMES' SWORD COMPANY of Chicopu, Mex., is at work on a large order for sabers for the Chinese Government, with expectations of still further orders.

SCIENTIFIC PROGRESS.

The Antiquity of Man.

Prof. J. D. Whitney, from the remains found by him in California, is of the opinion that man existed there as long ago as the Tertiary period; that he was then the maker of instruments for grinding corn, as well as other implements of stone, and, as far as the examination of the imperfect skull which was found warrants a conclusion, that he was, at that remote period, the same anatomically as he is now. These discoveries of Prof. Whitney's go to show that man existed during the Glacial epoch, which is confirmed after seven years' examination of the deposits in the Victoria Cave, in England, and by recent discoveries in the inter-glacial coal-beds of Switzerland. The Glacial epoch is computed by Mr. Croll, in his recent work, to have ended about 80,000 years ago; and Mr. Croll is not only one of the best authorities, but the one whose estimate of the time is the lowest.

In regard to the finding, in Victoria Cave, above referred to, Dr. Tiddleman, in his report, assigns to the pre-glacial or the glacial age the lower deposits of the cave, which contain early Pleistocene animal remains associated with a human fibula. The animal bones were nearly all mere fragments, though one was perfect; they represent bears, oxen, deer, goats or sheep, elephants, swans, etc.

Attention was called in the report to the great distance of time which separated that age from our own. In the cave Roman times were separated from our day by deposits less than a foot thick, but nowhere by more than two feet of talus, the chips which time detached from the cliffs above. The Neolithic age, which antiquaries know was a considerable time before the Roman occupation, is represented in some places at a depth of four or five feet beneath the Roman layer, but at others it runs into it. Then come nine feet of talus without a record of any living thing. Judging by the shallowness of the Roman layer, this must represent an enormous interval of time. Next come the bowlders, the inscribed records of the glacial period. They must represent a long series of climatic changes during which the ice was waxing and waning, advancing and moving back over the mouth of the cave. Then there is a break in the continuity of the deposits, the bowlders lying on the edges of the older beds, which shows that time was given for changes to take place to allow the district to cool down from a warmth suitable to the hippopotamus and become a fitting pasture for the reindeer.

It was in that warm period that the man lived and died whose fibula occurs among the bones in the cave.

A Costly Anæsthetic.

The new anæsthetic, hydro-chlorate of cocaine, mention of which was made in a late issue, is a very costly preparation, which thus far has been prepared at Darmstadt. We find in one of our dailies the following information bearing upon its uses and cost:

To say that an object is worth its weight in gold is ordinarily considered an exaggeration sanctioned by usage. A far more valuable standard of comparison might be found in the drug cocaine. Eighteen carat gold is worth about $16 an ounce. A recent importation of cocaine cost $8 a gramme or $224 an ounce. An apothecary's pound of this substance would therefore cost over $3,500. It is obtained from the cocoa-leaf to which the natives of South America ascribe the most wonderful strength-ening powers. It is said that by chewing this leaf and swallowing the saliva, which is mixed with its juices, they can travel an incredible length of time without other food. Cocaine, which is manufactured from this leaf, is a colorless crystalline powder, although the crystals have no distinctive and definite shape. In color it is a pale yellow, and much resembles a high quality of brown sugar. It is used principally in operation upon the eye. It deadens the nerves temporarily and thus supersedes the use of chloroform. For an operation, a four per cent solution of cocaine is used. Such a solution costs $10 an ounce, and only a few drops are necessary. Cocaine has, however, the same effect upon all parts of the mucous membrane, and its use is extending. If, for instance, a small grain be placed upon the tongue, it will soon produce a peculiar numbness, and deaden any sensation of pain. Large chemical houses in this country have recently attempted to manufacture the drug, and although they have not been successful in placing it in the market, they hope soon to do so. The price will then probably be considerably lower.

THE SUN'S HEAT.—Is the radiation of the sun a constant quantity? This is a most difficult question to answer. The vine and the olive flourish to-day, as they did 2,000 years ago. From geology we can gather no certain evidence. Some have said that the constant rushing of meteoric bodies into the sun feed it and keep up its heat. We can calculate this matter, and let us see how much would be required. If you should take the moon, and crumble it up, and pour it into the sun, it would not keep up its heat for a twelve-month. No, this cannot be. Then, is the sun a red hot body gradually cooling? No. Then is it burning out, consuming itself? In such a case, it would have been all burned out by this time. Humboldt discovered the clue to this problem. The sun is gradually growing smaller, four miles in a century. As the particles grow smaller, they crowd closer together. And here in this delicate relation we find a solution of this question. I may seem to state a paradox, when I say that while the sun is losing heat, it is growing hotter. As the sun shrinks, it parts with heat, but, if the sun is gaseous, the quality left, grows hotter and hotter. This cannot go on forever. It is doubtless true that the sun is more brilliant than it was ages ago, but when the sun shrinks so as to become mostly solid, this brilliancy will cease to increase, and the heat will eventually cease. As the sun is decreasing in size, so once it must in ages agone have been a hundred times larger than at present, and far back enough have been a diffused object, a mass of nebulous matter.—*Exchange.*

LIFE IN HIGH ALTITUDES.—The question often occurs, at what hight can men live? A recent traveler in Asia, Mr. Webster, states that he has lived four months at the hight of more than 15,000 feet above the ocean, with the following results: His pulse, normally, only 63 beats per minute, seldom fell below 100 beats per minute during the time he lived at that altitude. His respirations were often twice as numerous as under ordinary circumstances. A run of 140 yards would quicken both pulse and respiration more than a run of 1,000 at the sea level, and the higher the altitude at which he resided the greater he found the difficulty of walking or running fast.

PAPER FROM BAGASSE.—A recent edition of the New Orleans *Picayune* was printed on paper made of bagasse, the refuse of sugar cane after the juice is squeezed out. This event has created a stir in several quarters. The sugar planters of Louisiana, who have burned this hitherto worthless stuff to get rid of it, now see a possibility of making money out of it, and a few enthusiasts reckon that it will be nearly as profitable as the sugar crop. Southern capital sees a new opening for investment in the manufacture of bagasse, and paper buyers in the South look forward to emancipation from Northern mills and heavy transportation charges on their purchases.

OXYGEN IN IRON.—Recent investigations, says Mr. I. Lowthian Bell, have led chemists to ascribe, among other causes, the want of malleability—or red shortness, as it is termed—in heated iron to the presence of oxygen gas in some form or another. Three specimens made at the Monkbridge Works, one of them red short, were recently sent to me for examination, and their composition entirely confirmed the soundness of this opinion. On analysis, the two samples that were free from this defect contained only 0.750 and 0.704 per cent, respectively, of oxygen, while the one complained of gave 1.384 per cent.

WHAT IS CHEMISTRY AND WHAT ITS USE?—Practically, chemistry is a science which takes things to pieces and finds out what they are composed of. Not breaking them up, as children do toys, but separating the various gases, acids etc., even to the smallest particles. It teaches us that there are sixty-three elementary substances in nature, but of these only one-fourth are used in our bodies, viz.: Oxygen, hydrogen, nitrogen, carbon (coal is one form of carbon,) sulphur, phosphorus, silicon, chlorine, fluorine, potassium, calcium (lime,) magnesium and iron.

A PECULIARITY OF SALMON.—Hon. C. Leine, a member of the Oregon Legislature, and a gentleman who has long been identified with the salmon interests of Oregon, recently said in the course of conversation "Salmon can talk, that is, I have demonstrated that salmon, when taken alive from the traps, immediately make a hard fight for their lives, uttering a loud and peculiar noise, which indicates distress and fear, and is pitiful to hear. They have enormous strength, and frequently strike their captors very severe blows."

ACTION OF HYDROCHLORIC ACID ON LEAD.—Most authors say that lead is only slightly affected by hydrochloric acid; but Mr. S. P. Sharples reports that lead tanks, which withstood sulphuric acid perfectly, are soon destroyed by hydrochloric acid. In some recent experiments, undertaken to destroy cotton fiber by means of hot hydrochloric acid, he found that lead lined vessels were soon rendered useless by it. Even the cold acid could not be kept in wooden tanks lined with lead.

PROGRESS OF PHOTOGRAPHY.—A recent number of the *Photographic News* contains a reproduction of a photograph of the Paris express train taken by an exposure of the entire plate for one three-hundredth part of a second—a side view, while the train was running at a velocity of forty-two miles per hour. There is a slight blurring in some of the details of the picture, but in general it looks as if the cars and locomotive were standing still.

HUMAN MOTIVE POWER.—Marey of Paris, has succeeded in measuring the motive power of the human body as developed in every movement. As one of the results of his studies, he shows that something is gained in the power of walking by quickening the pace from forty to seventy-five steps per minute. The latter figure is the extreme limit; with a greater number of steps, power would be lost instead of gained.

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Passing Events.

The heavy northerly gale which occurred on Saturday and Sunday last did more or less damage in the interior, and injured the shipping and wharves in San Francisco Bay, causing a great deal of loss. It was the most severe blow which has been experienced here for many years.

The "new departure" on the Comstock lode, of discontinuing work in the north end mines, below the 2700-ft level, does not seem to be looked at in a had light by the miners there. Most of the miners wish to see work resumed in the upper levels of the Mexican and Sierra Nevada at points where it is known that there is some ore. In starting in upon these levels more men will probably be employed than are now at work.

California will make a better display at the New Orleans Exposition than was at first expected, a large amount of material having been sent on from here.

The strike at Bodie, referred to in our "Mining Summary," is very encouraging to the people of that camp, and leads to the hope of rich developments which will be greatly beneficial to the whole district.

The mines in San Bernardino county and those in Trinity county, at opposite ends of the State, are now attracting great attention from mining men. From both regions the news is very encouraging.

A New High Grade Explosive.

In last week's PRESS we gave a description of a new blasting compound invented by Josbua A. Robertson, of this city, who has assigned his patent rights to Chas. W. Randall, also of San Francisco. Mr. Robertson has also invented a new dynamite, which he claims to be superior to those nitro-glycerine compounds now in use for blasting purposes, in mining and similar operations.

The primary object of the invention is to produce the most perfect, intimate, and tenacious union between the particles of nitro-glycerine and the particles of the substance or substances with which it may be associated in the manufacture of explosive compounds, in order that the resulting compound may, under all circumstances and conditions, retain intact its full complement of nitro-glycerine.

Many of the explosive compounds heretofore in use, especially those composed of a mixture of nitro-glycerine with infusorial or silicious earths, require a large percentage of nitro-glycerine to insure their detonation, and an important result of Mr. Robertson's process is to produce an explosive compound in which a comparatively small proportion of nitro-glycerine can be readily exploded.

It is a well-known fact that many substances susceptible of crystallization unite in certain definite proportions with water to form crystals and that the proportion in which this water of crystallization unites with any given substance is unchangeable and constant. A definite affinity or attraction appears to exist between the atoms of water and the atoms of the crystallizable substance, which, if not absolutely chemical in its nature, approaches nearly thereto.

Mr. Robertson has discovered that if the water of crystallization be thoroughly expelled and eliminated from a crystalline salt of an alkali earth or metal, and the salt thus deprived of its water of crystallization, be at once brought into contact with nitro-glycerine, an immediate and intimate combination of the anhydrous salt and the nitro-glycerine takes place, and a new compound is formed which is permanent and homogeneous in character, and which possesses certain distinct and desirable properties, not possessed in similar degree by any nitro-glycerine compound heretofore in use. The nitro-glycerine replaces the water of crystallization, and the salt, which in becoming anhydrous became at the same time amorphous, after its mixture with nitro glycerine, becomes granular. The explosive compound thus formed is claimed to be much less liable to accidental explosion than that formed in the old way. It is constant and uniform in its composition, and by reason of this homogeneity it is much safer. Further, its susceptibility to explosion is the same in all its parts.

Nitro-glycerine compounds formed in the mode used before this invention, when exposed to certain slight increase of heat, exude or give up a portion of their nitro-glycerine, and the paper or cases containing them become saturated with pure nitro-glycerine, and are thus exposed to the danger of premature and accidental explosions. As is well known, many fatal explosions have occurred from this cause.

It is a material point in this invention, that the salt should be deprived of its water of crystallization, and while thus freed from this water, should be brought into contact with the nitro-glycerine. The salt may be thus freed in any of the well-known ways, as by a reverberatory or other furnace, a degree of heat being applied sufficient for the purpose. The best results are attained by uniting the anhydrous substance employed immediately, or very soon after the former has been deprived of its water of crystallization.

To manufacture an explosive compound according to Mr. Robertson's plan, he first thoroughly and completely expels the water of crystallization from a sufficient quantity of the material selected, and the anhydrous product is next reduced to an impalpable powder. He then places 65 parts of the material thus prepared in a wooden tank or other suitable receptacle, and gradually adds thereto 35 parts of nitro-glycerine, mixing the ingredients thoroughly by stirring.

The mixture is stirred by a wooden rake or other suitable utensil until the union between the anhydrous material and nitro-glycerine is perfect, and a compound of a granular texture is produced. The compound is then ready to be placed into cartridges for use. Care should be taken not to add sufficient nitro-glycerine to reduce the compound to a soft or pasty consistence, and a dry, granular substance is produced. In this invention the nitro glycerine is simply substituted for the water of crystallization.

Roasting of Copper Ores and Mattes.

The ordinary furnaces for chloridizing roasting of silver ores are not suited to the oxidizing roasting of copper ores, and the Gerstenhofer furnace, in which the pulverized ore, fed in at the top by rollers, is interrupted in going down the vertical shaft by retarding shelves, while being used in Europe, has not proved successful in this country, and is expensive and of limited capacity. Various other forms of shelf furnaces are in use at sulphuric acid works, for the roasting of fines, but none of them offer any inducement to the copper smelter, whose only aim is to remove the sulphur from the ore or matte as passed out, without caring what becomes of it. We are therefore reduced to reverberatory furnaces for the preparatory calcination of ores and mattes in a pulverized condition, so the present large calciners are preferred. When the sulphurous acid is to be carried to lead chambers, the muffle form of reverberatory is employed where the gas from the ore is kept separate from products of combustion. Otherwise the ordinary open hearth is more economical in both construction and use of fuel.

The saving of fuel is the principal object to strive for, next to a good roast, and this can be attained in treating highly pyritous ores by greatly lengthening the hearth of the furnace and depending on the oxidation of sulphur as a source of heat. In a chapter on this subject in the Geological Survey Report, Mr. Edward D. Peters, Jr., gives some observations which may be of use in determining the size and shape of furnace to employ under any given condition. He says that 40 feet is none too long for an ore or matte containing 25 per cent sulphur, and by introducing the green ore in charges of say 1,000 pounds, at the flue end of the furnace, and gradually working it forward to the withdrawing door, nearest the fireplace, an excellent roast and uniform heat can be attained with a minimum of fuel. For less sulphurous ores, 30 to 40 feet is about the proper length. Under any circumstances, where a large production is required, the hearth should be at least 12 feet broad, with an arch rising three quarters of an inch to the foot. Too much attention cannot be paid to supporting the skewback, both with stout horizontal bars or plates of iron, as well as these, in their turn, with strong buckstaves, tied with ½-inch wire. The tie-rods should end in loops rather than in nuts, as the thread is frequently stripped by a strain that is less than half the tensile strength of the rod. A good draught is of the greatest importance, and this should be so regulated by dampers and by firing that the flame rolls along the arch in reddish, curly waves, traveling at the rate of about three feet per second, and never touching the ore, as otherwise a reducing action is liable to occur. Until these conditions are fulfilled, no superintendent should be satisfied with the behavior of his furnace. Mr. Peters says further that it is a most economical plan to do away with the large ash-pit at the rear of the furnace, as is the custom in England, where fuel is plenty and good, and instead of firing on a clinker-grate—as nearly all Swansea furnacemen will insist on doing unless prohibited—to keep a thin overlayer of soft coal on the grate bars, and have the ash-pit open at each side of the furnace, directly under the fire doors. The ash-pit should be provided with close-fitting iron doors, which should be ordinarily only a crack open; and if this seems to cause a lack of air in the furnace, a series of holes should be opened in the crown, just even with the first line of the fire-bridge.

NEIL MCGONIGLE, one of the Pacific Coast Argonauts, and a well-known mining man, formerly of Cornucopia and Tuscarora, Nev., was found dead in his bed at Hailey, I. T., on the 6th instant; supposed cause, heart disease.

IT IS now stated that work will be commenced at once rebuilding the Paradise Valley quartz mill, Nevada. It will be much easier to get heavy machinery on the ground this winter, while the roads are good, than in the spring.

The State Mineralogist's Report.

The Fourth Annual Report of the State Mineralogist of California, Mr. Henry G. Hanks, has been published. It contains information, general and statistical; relating to the mining, agricultural, manufacturing and other resources of the State, and comprises some 400 pages. The report is the most useful which has been issued by the mineralogist, and contains much information of value to the mining community. There is a catalogue and description of the minerals of California, as far as known, with special reference to those having an economic value. This list is alphabetically arranged. It gives the name of the mineral, composition, characteristics, occurrence, uses, etc. In this list is given the localities where it occurs in California. In the case of minerals or metals of industrial importance, some account is given of how and where they are worked in this State, and such general information as could be collected has been compiled, somewhat after the manner of Williams' Mineral Resources of the United States, published by the U. S. Geological Survey.

While there is more or less matter concerning the ancients, foreign localities and early history of some of the substances, which perhaps more properly belongs in the text books, and make the report look somewhat "padded," the book as a whole is a useful one to the mining interests. From it people interested in any particular substance can tell in what localities it is found here, and if it is being utilized. Some of the statistics might have been brought closer to date with benefit, though that may be due to the fact of sending the copy to printers early. For instance, the exports of quicksilver for San Francisco are only given to the end of 1883, and the production of the mines of the State only up to April of this year. The table showing where our supplies of coal came from, are only brought up to the end of last year, as also the yield of our mines. The report was, however, transmitted to the Governor, on June 15th, so nothing later than May could well be put in.

Mr. Hanks has labored under the great disadvantage of being short of funds to carry out his work, and has therefore not been able to do exactly as he desired. He has been assisted in preparing his report by Dr. Henry De Groot. Miners may obtain the report by writing to the State Mineralogist, at 212 Sutter street, in this city. Not only the precious metals, but all the mineral products of the State are referred to at more or less length, and all interested in the mining industry should preserve the report as valuable for reference.

Quartz Mill Screens.

The manufacture of screens for quartz mill use on this coast has grown to larger proportions than most people would imagine. Both wire and punched screens are in use here, and are made in quantities in this city. The California Perforating Screen Co., at No. 214 California street, have been for some time manufacturing "punched" screens, for which they have the latest and most improved machinery. They make from No. 1 to No. 12 slot. They make every variety of slot, but the one for which they have the greatest demand is the quarter-inch improved angle slot for mining purposes. Wherever this slot has been once used they order it again and care for nothing else. The mills have heretofore been using all kinds of slot; but these works are trying to establish a regular size—that which has given the best satisfaction. In this the slot is quarter-inch long, set at an angle in the plate. It is said to be much superior to the old style, and to prevent "slimes."

To get these plates the mill owners send down to the screen makers the size of the battery and they make them to fit exactly. Only the best Russia iron is used in making these plates.

At these works they punch steel for smut jackets for smelting furnaces; make zinc screens for flour mills which are used for cleaning wheat, etc. They also make the punched iron for breweries and malt houses, for malt kiln flour, and screens for similar purposes.

The idea in establishing these works is to keep all this sort of work on this coast and stop the importation of screens, thus building up another industry in California. They are even so fixed that they can compete with Eastern works and can turn out as good screens as any in the United States. The screens can be made here at the same prices as Eastern manufacturers. The trade is mainly confined to California, Nevada, Montana, Idaho, Colorado, New Mexico, Arizona, Oregon and Mexico.

Steam Boiler Explosions.

While we are fortunate in San Francisco in having so few boiler explosions, it by no means follows that there are not numbers of boilers in an unsafe, and some in a dangerous condition, as regards their liability to explode under but little more than ordinary circumstances.

Probably, if questioned on the subject, ninety of each one hundred owners of steam boilers would say that their boilers were safe, and that the engineer in charge was a careful man, who knew just what he was about when he took charge of a boiler, and if there was any subject on which the engineer was especially posted it was the care and management of steam boilers. It is well to have a good opinion of the person to whom you intrust valuable property and on whose care and intelligent judgment human lives are dependent; but few of the many steam boiler owners know anything about the care and management of them, and are often liable to be misled by some plausible person who may have many pretensions and but little knowledge.

To the superficial observer it seems a simple matter to throw a few shovelfuls of coal into the furnace, and occasionally to watch a pump that is supplying the boiler with water—"only this, and nothing more." If you think no particular amount of brains are required, just spend a week or two along with any one of many engineers of this city, and you will wonder how human muscle can stand the work that is performed in running a boiler or pair of boilers such as may be seen in common use in our mills and factories. Probably not many branches of labor call for a more incessant attention, and require a more instantaneous perception of the varying condition of boilers under steam, than the engineers and firemen in charge. There must be an intuitive perception of a change that is about to take place. So much is this the case, that experience has shown that in many cases the action of an engineer or fireman in either opening or closing the draft, or firing up, or other operations connected with the working of the boiler, commences as soon as the thought occurs to the mind and a movement is made before the thought can hardly be formulated in words. The ear of the engineer has become so trained to the variety of sounds which emanate from escaping steam, and the eye has so often noted the changes which occur with varying conditions under which boilers are worked that the slightest sound unusual to a normal condition instantly attracts his attention, and the eye quickly follows the direction which the listening ear indicates as the point from which the new sound proceeds. Almost as instantly as the ear and eye locate the unusual sound, intuitive action is taken to remedy or counteract any wrong effect which might be produced.

Often too much work is placed upon the shoulders of the engineer. He is first of all expected to keep the engine running, no matter what may be the care and attention required to keep hot journals cool and to keep the speed required for the work to be performed. He is also expected to keep up plenty of steam, and at the same time to use the cheapest (per ton) fuel in the market, no matter whether the boiler furnace is adapted for it or not—always keep plenty of water in the boiler, and perhaps this is so called artesian water which may have 40 or more grains of solid matter to the gallon, and at the same time the boiler must be kept free from scale. Perhaps the work to be done requires the engine to be run 12 or 14 hours each day and only shut down on Sunday. Then the engineer is expected to rest on that day by washing out the boilers, cleaning up the engine repacking joints and valve stems, and doing all the little jobs of overhauling that have been accumulating all the week, and when he gets through with this day of rest, he is so near tired out that he is in the worst possible condition for commencing a new week, while the proprietor has been away from Saturday afternoon till Monday morning enjoying himself with his family, and congratulating himself, if he ever thinks of his boiler, that he has got such a faithful engineer that he won't let anything go amiss, and when he passes through the mill or factory on Monday, looks on the bright side of everything but the engineer's pay, and that never gets brighter from its increased size.

Perhaps the engine and boiler are stuck away in some basement, on a level with the sewers and where an atmosphere filled with miasma is being constantly breathed by those engineers condemned to a tenancy; then the situation is still worse. No sympathy is wasted on the unfortunate being condemned to such a life, but we hope the time will come when owners of steam boilers will see and understand the needs of those whom they employ in such responsible positions and award them a modicum of the credit to which they are entitled. Many owners look upon an engineer as a commodity to be purchased at the cheapest price with no value as to quality. This action on the part of owners has induced men to seek positions for which they were not fitted by either education or experience.

We are glad to see the efforts which are being made by the Society of Stationary Engineers in this city (and which is a branch of the National Association) to inform and instruct their members in the intelligent care and management of steam boilers and engines. They have discussions on various questions concerning the subject, and are having lectures delivered before their society, by engineers well-informed on their subjects; and, by each member either giving his experience or asking the advice of others, touching some question which he is unable to solve, create a great and growing interest, and are accomplishing much toward placing themselves upon a higher plane, which by its own merits, compels the attention of their employers, and will in time, we hope, occupy a position to which they are entitled by their efforts to inform and educate themselves for a better fulfilling of the responsible duties of their positions. This subject of the condition of steam boilers under use, has attracted much attention, and companies have been formed for the purpose of periodical inspection of boilers, for owners guaranteeing their inspection by insuring the owners against loss or damage by explosion, while they are prepared to advise those who accept their supervision and inspection as to any change of construction or arrangement whereby steam may be generated more economically and with a greater degree of safety. This will be of much assistance and benefit to the Society of Stationary Engineers, as the tendency will be to employ more experienced men for the supervision and running of boilers and engines. The subject is one well worthy the attention of the owners of boilers, and should be carefully considered by all interested to the end that all necessary precautions may be taken to protect life and property from damage by steam boiler explosions.

Preventing Spontaneous Combustion of Coal.

A new system of preventing stacks of coal from the danger of spontaneous combustion is now attracting some attention. The system alone is also claimed to prevent the usual deterioration of coal when exposed to the weather. It is the invention of Mr. Franz Poech, of Vienna. It is well known, says the author, that mineral coal, especially the less compact lignites, holding much water, crumbles gradually by exposure to the air for some time, and the finest and most valuable pieces are gradually converted into rubbish and dust, have a tendency to ignite spontaneously, and many a coal depot has already been destroyed by this action.

Coal, when stacked, can be preserved only by maintaining its pores filled with water to exclude the air. This has been attempted by frequent watering in dry weather; but it has been found that unless the watering be practically constant, the effect is not satisfactory, on account of the rapid drying which takes place in certain states of the weather. Constant watering is, however, impracticable, and Mr. Poech has essayed, and it appears with success, to devise a system for keeping the pores filled to the natural degree of humidity by means of steam. According to this system, the stacks of coal are piled up over a number of steam conduits. These conduits are of the simplest character, being merely trenches in the ground, parallel to one another, and separated by intervals of about two feet. These trenches are covered with slabs of wood, and the coal is tipped upon them. The trenches are in communication, by means of a pipe, with the exhaust from the engines; and by this means they are kept filled with steam, or rather with vapor of water, which ascends through the stack. This vapor displaces the atmospheric air, and, by its condensation or arrest in the pores of the coal, Bituminous coal is less liable to crumble, but loses by exposure in calorific power, and those varieties applicable for the production of coke lose the power of coking. Most mineral coals prevents chemical actions from taking place to the detriment of the fuel. From actual experience gained with this system, the cost appears to be about 5½d. for a stack of 1,000 tons; that is, the cost of construction. And for this quantity of 1,000 tons, the exhaust of a five-horse engine is sufficient. At several collieries in Bohemia this system has been established for some time, and the results have proved so satisfactory that it is now being adopted in several places on the continent. The system is simple and may be tried anywhere with very little expense or trouble.

Old and New Methods of Coal Mining.

The Connellsville coal field, Pennsylvania, extends from a point a few miles south of Uniontown, in Fayette county, extending through that and Westmoreland county, with its terminal prongs on the southern portion of Indiana county, north of the town of Plainsville.

The mine workings of this region are confined to the one principal seam, the Connellsville or Pittsburgh coal-bed, which is found here in its best development as regards size, while its quality of coal is peculiarly adapted to the great industry of the region—coke-making.

This large coal-bed preserves a remarkable uniformity of thickness over the whole field, generally affording from eight to nine feet of coal, and seldom falling below seven feet in thickness. The special position and condition of the Connellsville coal-bed for working has made this region famous. It is, in fact, the Durham of America.

At a recent meeting of the American Institute of Mining Engineers, Mr. John E. Fulton read a paper on coal mining in this region. From this paper we take the following concerning old and new methods of coal mining:

In addition the coal used for coke-making, from 100,000 to 150,000 tons are now annually shipped for other purposes, making the total coal required from the mines, when all the ovens are in operation, 8,500,000 tons, nearly. Taking the product of an acre of coal at 13,500 tons net, the present annual requirement of full work would exhaust the coal from a square mile of this territory each year.

The early methods of coal-mining for coking consisted mainly in slopes, following the coal-bed down its dip towards the bottom of the basin. The main headings were usually driven at right angles to the slope. "Butt"-headings were driven from the adits at angles to insure moderate gradients across the floor of the coal-bed; from these the rooms were laid off mainly parallel to the main headings. The rooms were made of a width to suit the tenacity of the roof, usually 10 to 14 feet, the "ribs" or pillars being eight to twelve feet thick. (See engraving.)

From the beginning of mining operations until the year 1882, little attention was given to exhaustive mining. The coal-pillars or "ribs" were left as narrow as possible in the direct working of rooms. When these rooms had been driven to their full length, then in coming back the ribs were further reduced by cutting along their flanks or by cross-cuts through these pillars, the remainder gradually splintering down, with the entire loss of from 20 to 40 per cent of the coal. A very large area of this fine coal-bed has been lost in this way. In the sections of the coal-field where the covering is light, the presence of these lost coal-pillars can be plainly seen on the surface in ridges, between the greater depressions caused by the full sinking of the room-workings.

During the year 1882, a revision of the previous wasteful methods of mining was carefully considered, and some of the companies adopted the plan of exhaustive mining, by withdrawing the coal-pillars between rooms, when the latter reached their full length of 300 feet, more or less (See engraving) the coal was lost in ribs and pillars. This loss would be 4,455 net tons per acre. Extracting the coal at a royalty of nine cents per ton, there is a loss of $400.95 per acre. On the other hand, owners of coal rights do not generally own the surface of the land. The land is quite valuable for agriculture, selling at $100 per acre. Any mining operations displacing the surface or injuring it for farming purposes would mean damages, when 100 feet or upwards is found over the coal bed. Very little, if any disturbance of the soil follows, and the enlarged space occupied by the breaking up of the roof-slates and sandstones compensates for the coal spaces made vacant. But anticipating the worth, condition of shallow covering and breaking up of the land surface at $30 per acre, a balance of $370 per acre would remain to reward exhaustive working.

When other sources of economy are considered, such as the hauling out of the pillar coal over the room tracks previously laid down, the saving of the props, and the improved condition of the air, by confining it to the actual workings, it is safe to say that at least $400 per acre should be saved by exhaustive mining.

The Mineral Belt of Amador County.

In the PRESS of Nov. 29th, I gave some account of the rich mines on the Mother lode in Amador county, and now continue my description:

The facilities for working all these mines in and along this "mineral belt," or "Mother lode," are A No. 1, in all respects, as none of them are in deep canyons and gulches almost inaccessible, as many of the rich mines are throughout the United States and elsewhere, but all are along good, natural and almost local roads. I now have reference more particularly to the mines at and between Jackson, and the Nevills or "Mammoth mines," nor are they one or two thousand miles away from civilization, and amongst Indians and desperadoes, where the expense of getting anything required to work the mines, is enormous and costly, and where there is little or no water or timber in the country, or where the climate is so hot as to prevent a profitable working of the mines. Nor are they in a cold country, where only three to four months out of a year they can be worked with advantage, or worked at all, as is the case in the Montana and Idaho mines. They are, as it were, right at home, close to all kinds of mining and mill machinery, with wood and water in abundance, good society, schools and churches, and good roads almost everywhere, and where law and order prevails throughout the country, at all times. Where life, liberty and the pursuit of business is guaranteed, and all property safe and secure. Where capital is very largly invested.

Hence money invested in mining here, either on a large scale or in a small way, is much more desirable than in out-of-the-way and far-off distant sections of our mining regions in the United States and Mexico, where neither life, liberty or the pursuit of business is safe or certain. This and all these facts go farther and do more, or ought to, to induce men of capital to invest their money and means in legitimate gold quartz mining in this home and central, as well as accessible, mining country, than any of the rich leads so distant from all these advantages that are here to be found and had. The Amador Canal and Ditch Company's ditch runs along and above all the mines in this mineral belt or "Mother lode." The capacity of the ditch here at the Nevills mine at present is some 200 miner's inches and can be increased to as large a figure as may be required.

There are ten or a dozen other good mines here, and amongst them the large, productive mines, above referred to, that are being worked by their owners in a small way, that are producing good, rich results, and when worked with a larger capital and by experienced miners must, and will doubtless, prove equally as rich mines as there are now being so worked here. If I were to give any advice to moneyed or mining men it would be: Invest largely here in this "Mother lode," in Amador county, for the very urgent reasons given above in this communication, as the surest results and the largest returns and output of gold will be found here in little Amador county in Central California, and not in either the one extreme or the other of the State. For here it is that mines can be worked the year round and not only three or four or even six months out of the year, but the whole 12 months—every one of the 52 weeks in the year—can these mines be worked, and at the smallest possible cost of living, and everything else pertaining to mining. These are the most important and vital questions for Eastern capitalists to consider before they put their money into mining anywhere, and should be the one item for them to consider in so doing every time.

A word more in regard to the "fabulously rich Gwin mine," just across the river in Calaveras county. It has been said by those who know that not less than ten millions of dollars has been stolen from this mine during the years of its successful working, by the hands working the mines, so very rich and numerous were the native gold chunks and nuggets found in that mine. This was the fault of bad men and worse management in the working of this mine, and yet, with all their stealing, it paid its tens of millions of dollars to its owners. I will also say that the "Mammoth No. 2" mine that joins this Nevills or Mammoth mine, and which is owned by Dr. Chambers above referred to, is in this "Gwin lead," being the same distance from the river on the north as the Gwin mine is from it south, and about the same altitude or hight upon the hill or mountain. The lights at night are seen from the door of the doctor's cottage in the houses at the "Gwin mine," and in the day time the buildings of the "Gwin mine" are to be seen south of the doctor's house, and upon a level with it, and in a bee-line only about two miles distant from this mine of Dr. Chambers. Hence, any one would naturally come to the conclusion that no better or surer and safer investment could be made than to take this "Mammoth No. 2" mine of his and develop it for an interest in the mine as I have stated in a former part of this article. At least if the writer had the means at command or of his own he should look no farther but at once "jump at the chance" of this offer to open up and develop this mine, feeling sure that an abundant reward in the shape of rich gold bearing metal and quartz awaited him in the near future.

In conclusion, I will say that the only incongruity that I see about this very pleasant home and cottage of Dr. Chambers (post-office address is Jackson, Amador Co.,) is the fact that he has no wife to occupy or preside over this most delightful home and ranch of his, where he has set out several hundred choice fruit trees and grape vines. He has a fine flock of 100 or more chickens, a lot of turkeys, tame pigeons and some stands of the finest Italian honey bees, and yet this is leap year and it has nearly gone by at that. The doctor would pass anywhere for a "gentleman and a scholar" in every sense of the words. WELLINGTON.

Ownership of Water.

EDITORS PRESS: The laws that govern, and the laws that ought to govern in the use of streams of water is a subject which should be studied by every landholder. The subject has been written upon and decided upon from such varying standpoints that it is a very difficult one to discuss in a newspaper article. We can make no progress on it whatever unless we begin at the foundation. There are two theories which have prevailed alternately or have been mixed together like oil and water without an alkali, till the public mind has no decided opinion. One theory is that water being a natural element belongs to the whole people and any use of it must be consistent with the greatest good to the whole people. The other theory is that water can be owned as absolutely as any property created by labor. The former theory was held by Frederick the Great, and the latter theory was held by his four judges in the famous case, the Nobleman vs. the Miller. (See Abbott's Life of Frederick II. page 557, 1770.)

The case is thus stated by the King. "May a miller who has no water and consequently cannot grind have his mill taken from him? Is that just? Here is a nobleman wishing to make a fish pond, he has a ditch dug to draw into it a small stream which drives a water-mill. Thereby the miller loses his water and cannot grind. Yet in spite of this it is pretended that the miller shall pay his rent quite the same as at the time when he had full water for his mill. Of course he cannot pay his rent. His incomings are gone. And what does the court of Custrin do? It orders the mill to be sold that the nobleman may have his rent. All men being equal before the law—the prince is the same as the peasant before the law."

The King then ordered his four judges fined and imprisoned for a year. The King thought these judges were corrupt at heart, when they were only corrupt in the head by reading the letter of the common law without understanding its purpose. How they felt into error may be discovered by reading the law as stated by Angel, Chap. I., (I quote from memory) "The owners of land on a natural water-course are the owners in common of the water for a beneficial use." No doubt these judges were educated as thousands of others to believe that ownership of land was an absolute ownership, while the owuership of water was a kind of partnership absolute ownership. According to their theory the miller was not an owner of land therefore owned no water. The nobleman owned land on the stream, therefore owned an undivided share of the water and could do as he pleased with it whether the use of it was beneficial to the whole people—the sovereign owners, or not.

The King was one of the best educated of men, and knew that the only benefit the stream could be to the miller was to give employment to his capital and labor; for all the powers of nature used in competition, result in an equal benefit to all. The farmer cannot charge for the rain that develops his crops, nor can the sea captain collect freight for the wind that drives his cargo to market. The purpose of the nobleman was purely selfish.

Frederick was right, and Angel is also right, if he means by "owner" one who has prior right, and by the word "beneficial use" a use that secures the greatest good to the greatest number of persons—the people. How could there exist a Common Law on riparian rights adapted to wet, dry, cold and hot countries, unless there was a central idea of promoting the public good and establishing equity between owners on streams and owners of the streams? To do this there must be rules applicable to all streams, while other rules must be sufficiently flexible to allow the public interests to be subserved under all the varying conditions of climate and human wants. Any person reading the Common Law with this central idea in mind will find nothing against the true doctrines of riparian rights.

What are the true doctrines? First, that the owners of land on a stream are given a prior right to use the waters thereof for beneficial purposes, each allowing all others an equal opportunity of the same use. The motive for granting this ownership is to stimulate the selfishness of men to bestow labor and capital on streams for the production of wealth. It is for the public good that individual wealth should be increased by the use of water. What use should have preference? The use that secures the greatest benefit to the greatest number of persons. If no drinking water can be obtained except from the stream, and all of it is needed to quench thirst, it is a necessity the law recognizes as more important than wealth, and such a stream must flow "unpolluted." If it is for the public good that a stream be used for milling, such a stream must flow "undiminished." If the greatest good to the greatest number requires the pollution of streams with mining debris, then all owners on the stream must submit to the lesser evil.

We want legislation limiting the amount of free water any person can use for irrigation. Allowing every owner of land, on easy terms, a connection with any ditch of natural water, and in time of scarcity, require the water supply to be equally distributed among all land owners prepared to use it, without regard to the amount of land they own. The doctrine of attaching water from a ditch to certain lands, is a dangerous one. It will lead to inequality and monopoly. The statute should require that every stream should be put to the most beneficial use, and provide ways to determine that use, and should give riparian proprietors a first right to use water to irrigate once, land not exceeding 120 acres, nor more than all others on the stream have a chance to irrigate. All surplus water above the amount thus provided for may be diverted for the same purpose to be as nearly equally divided among all persons demanding the same.

One thing as important as such statute law is proper officers to enforce it. The experiment has often been tried of allowing upper proprietors of judging what is their share of water in a dry season when the stream is worth several hundred dollars a day and always with disastrous results to confidence in human nature. In reading the history of litigation on riparian rights, the need of statute law becomes evident. Blundering judges who appear to have no sense of justice, reason or propriety, have muddled the subject by language of double meaning, so precedents can be found for deciding almost any case either one way or the opposite. All of this rubbish must be swept away before there can be peace or prosperity among irrigators. Our Constitution and statute laws are good as far as they go, and are founded on the principles I have herein set forth.

"The use of water is a public use," says the Constitution; so is that of a street because both belong to the whole people. The statute says streams may be diverted for any beneficial purpose, but not so as to interfere with riparian rights. The faults of the law consist in not defining and limiting those rights, and not guarding the people's interests in requiring an equitable division of all water diverted and providing officers to enforce the law on the spot.

Stockton, Cal. D. A. LEARNED.

Smelting Works.

It would be the best thing that could happen to the mining interests of Shasta county should the Denver (Col.) Smelting Company start branch works at a central point on the railroad above Redding. The president of that company and an experienced mineralogist have been in the county for the past ten days inspecting the mineral belt from Iron Mountain to Copper City; also taking samples of all kinds of ores and making assays of the same with a view of determining in their minds whether there are sufficient ore bodies that will yield enough of the various precious metals to support and warrant the erection of proper reduction and smelting works. We are informed that their investigation was quite as satisfactory as they wished, but they did not make a thorough examination and intend to do so before they abandon the idea. Iron Mountain came up to their expectations, and they were pleased and encouraged with their experiments of the silver ores of Squaw creek, although they have not yet given this body of ore a fair test. They do not alone rely on silver ores, but must know that there is sufficient gold-bearing quartz at a practical distance from the location of the works. This ore is only required to average enough to pay as a flux, but of course the richer it is the better for both the miner and proprietor of the reduction works. In order to get a fair idea of what this company desires to discover in this mineral region, we will state that gold and silver is not wholly relied upon. The arsenic, acids, copper, and all other base, marketable minerals are taken into consideration as component parts of the value of these ores, as we are informed, the mineral-bearing quartz is mixed together in one conglomerated mass in relative proportions and smelted together, thus the charge making its own flux. The fluxing material found in these mineral-bearing ores is one of the most important factors in determining, so we are informed, the establishment of this enterprise here. We sincerely hope this company will, after fair investigation, find that they can safely invest their capital in such an enterprise here, for it will immediately give an impetus to the mining industry of the county, which is hardly yet in its infancy, that will be worth ever so much to all concerned.—*Shasta Democrat.*

A DISPATCH from Clifton, A. T., dated the 1st inst., says: The product of black copper for the month of November was the largest in the history of the district. The Arizona companies' output in that period was 650,000 pounds, and the Detroit company's 540,000, a total of 1,190,000 pounds for the month. By the extension of the former company's system of railroads to several additional producing mines they will shortly be able to blow in two more furnaces, when the output of black copper, 98 per cent fine, will be largely increased.

MINERS' wages are being reduced throughout Utah to $3 per day.

Machinery in Drift Gravel Mining.

In no other branch of mining, says the *Mountain Messenger*, has so little improvement been made upon the original and primitive methods, as in drift gravel mining. It is true, that in a few instances, (notably in the Bald Mountain mine, in this (Sierra) county,) machinery is being used to cheapen and expedite the extraction of gold-bearing gravel, but with one or two exceptions the manner of working is substantially the same that it was almost in the beginning of the industry. In later days, the tunnel is somewhat larger and less sinuous. The timbering is more substantial. It is usual now to use posts from ten to twenty inches in diameter, and for special purposes a diameter of two feet is not uncommon. Caps range from twelve inches upwards. The original method of making a nearly square tunnel, has long been abandoned in the larger mines, and the custom now is to make the main tunnels at least seven feet on the bottom, six and a half to seven feet high, by three and a half feet at the top—all these measurements "in the clear," or inside the timbers. A cross-section of a modern mining tunnel would thus present the appearance of a perpendicularly bisected truncated pyramid. The object of thus placing the posts is to prevent that rapid crowding in at the bottom in soft ground, which with a post set perpendicularly would ensue, intailing delay, and expense for repairs.

Of late years "tee" rail has come largely into use in mining tunnels. This rail is either steel or iron, varying in weight from sixteen pounds to the yard and upwards for the former, to from twenty-four to forty-two pounds to the yard for the latter. The advantages of this rail over the strap rail laid on wooden stringers, are numerous and essential. While the first-cost is more, the wear upon wheels and car bodies is infinitely less, and the ease with which a car is moved, is much greater. Another advantage is that in swelling ground, this rail rises in long swells instead of sharp bummocks, the advantages of which in tunnels of moderate gradients are obvious. In the "car" there have been some minor improvements, but that vehicle is substantially the same, being a box upon four wheels. From bolding less than half a cubic yard, it has grown to hold a full cubic yard, weighing with its contents when full, about four thousand pounds. Instead of wheels loose upon the axles, they are rigid, and the axles of steel, turn in babbitted boxes of the self-oiling persuasion. Instead of the car being pushed by hand, mules are now used; where the distance is great, each animal taking a train of eight cars, more or less, depending upon the gradients to be overcome.

The foregoing are, in brief, the more important changes that have taken place in the evolution of drift gravel mining. In the economy of drift mining no inconsiderable expense attaches to moving the gravel from the inside of the mine to the dump. In the northern part of this (Sierra) county, a new appliance is to be made use of, by means of which the cost of gravel will be reduced to a point far below anything heretofore achieved in that line.

The Cleveland and Sierra M. Co. and the Sierra Union Water and M. Co. have consolidated for the purpose of working by the drifting process three miles of channel, extending from near the Iowa shaft to a point below Scales diggings. A tunnel has already been commenced at the lower end of the ground, of the following dimensions: Hight, 7 feet; width at bottom, 7 feet; width at top, 42 inches—all inside of timbers. The transporting power to be employed is an endless steel wire rope of probably half or three-quarters of an inch in diameter, running over large sheaves at the mouth and inner end of tunnel, or at a turnout as near the inner end as the exigencies of the work will permit. This cable will be carried along the top of the tunnel on small sheaves to the inner station, and back to the dump at the bottom of the tunnel between the rails, being supported along its course by small sheaves affixed to the mudsills at suitable distances apart. There is to be a special car fitted with a "grip," or device for clutching the cable when it is desired to move the cars, which will be run in trains of as many as necessary. At a point where lateral lines of track join the main track by means of switches, the switch rails are raised slightly, so that the car will pass over the cable on to the main line. The motive power will be water acting upon a "Pelton" wheel. When it is desired to send in a train of empty cars, the motion of the cable is reversed. The channel is known to have a grade of two and one-half feet to each hundred for a distance of three and one-half miles, consequently the loaded cars will require to be regulated simply as to speed. This machinery will not be put in until the tunnel is in one thousand feet. It will not be necessary to keep the tunnel absolutely straight, as no difficulty will be experienced in providing for slight deviations. No insuperable obstacles intervene as against a right angled or a return curve, if such were necessary. Geo. W. Cox is one of the principal owners. Joel Bean is the superintendent in charge.

ITALY sends on an average between 50 and 60 tons of eggs daily through the Gothard tunnel to north Europe. In one day this year 130 tons, representing about two millions of eggs, were landed at Harwich and sent on to London.

CALAVERAS MINES.—The Calaveras *Chronicle* says: There is no question but that there is a considerable area of mining ground in the county yet untouched that will pay well for working, while it is equally a fact that many claims abandoned in earlier days are being mined with profit to their owners. It is true that the surface diggings are nearly exhausted, but the hills have not yet been fully prospected, and it will be a long time yet before gravel mining enterprises will cease to be a remunerative investment to capital. While it is conceded that the surface deposits—those that were easily reached without difficulty or expense—are in a great degree exhausted, it by no means follows that, with the great reduction in the price of water and wages, together with the increased facilities for working to advantage which modern inventions have given, the deep diggings can now be made a profitable field for operation. In the early period of mining, men preferred the chances of making a "strike" to the sure and steady gains of patient industry. Claims that paid fair wages, even for those days, were abandoned in the hope of securing larger gains elsewhere. Since that period, however, hard times have overcome men's aversion to old diggings, and old claims that have lain idle for years are being eagerly sought.

SMALL SMELTERS. The query is often propounded to us, will small smelters pay? Experience has fully demonstrated in New Mexico that large smelting plants continue to pay and it is evident that the small ones do not pay or they would otherwise be in operation instead of idle. The large furnace requires no more attention or labor than one of a third its capacity, and on the other hand the large plant consumes less fuel in proportion to its capacity. Upon a general business basis the smelter should not only be of great capacity, but the company having it in hand should be the actual owners of a mine which affords a sufficient volume of good fluxing ore, including iron as well as lead, for it must be admitted that the high grade ores which in no small degree form the profit derived by the smelters are as a rule refractory. The day of small plants has passed away, and as in all other manufacturing enterprises, the greatest amount of production with the least expenditure of capital will control the market, just upon the principle that an article made by hand will cost infinitely more than one made in immense quantities by improved machinery.—*Socorro Bullion.*

THE MAGNITUDE OF OUR LUMBER INDUSTRY. Very few, even of those directly engaged in the business, have any adequate idea of the magnitude of the lumber interests of the country. According to the census reports, there were, in 1880, 25,780 lumbering establishments in this country, employing $181,000,000 capital, and 146,000 hands, distributing $31,000,000 a year in wages, using $146,000,000 worth of material, and turning out an annual product of $233,000,000. Of the whole product, Michigan produced 23 per cent, Pennsylvania 10 per cent, Wisconsin 8 per cent, New York and Indiana about 6 per cent each. Few of the Southern States reach a product of over $4,000,000. The whole South is a forest region, and its great pine, cedar, poplar, cypress and oak districts are still almost untouched, and must ultimately become the centers of this industry.

STEALING MINING MACHINERY.—Colorado papers say that a wholesale system of stealing mine machinery is practiced in that State. The owner of one mine at Leadville says he has lost by theft three hoisting plants within the last two years. In almost every instance, where operations on a mine have been temporarily suspended, when the owners or their agents visit the property to resume work, their machinery is found dismantled, every movable piece missing; and are fortunate if any covering is left over the property. Numerous instances can be cited where entire shaft-houses have been dismantled, all detachable pieces removed from the engine, and all the wrecked and valuable machinery left exposed to the elements. It is a mighty enterprising man who will steal a steam engine.

AT a meeting of the Board of Managers of the Nineteenth Industrial Fair of the Mechanics' Institute, held this week, the various committees on the Fair made reports, some of which were not final. The press was thanked for its good offices in regard to the exhibition. The receipts amounted to over $53,000, and the expenses to about $25,500, leaving a net profit of $37,500. The final reports will soon be published in book form. It was decided to hold a fair next year, beginning on the last Tuesday in August, 1885.

A RICH gold-bearing ledge has been struck on the desert, about five miles south of Kramer, a station on the A. & P., between Waterman and Mojave. Samples assay $70.23 per ton. The ledge is three feet wide and contains two feet of solid quartz. A silver ledge was found about six miles south of the gold find, but the assay is only $5.50 per ton.—*San Bernardino Index.*

THE professional mining claim "jumper" will soon be abroad. Look out for him. He will post notices all over the country in order that he may compel real miners to "see him" when they attempt to do something for the development of the country.

USEFUL INFORMATION.

How Kaleidoscopes Are Made.

But few people know the kaleidoscope is adapted for any other purpose than a mere plaything. It has been one of the most important mechanical instruments to aid designers. It is even claimed that all the useful arts would be improved by its more general use. The common kaleidoscope is very simple in its construction, but those used by artists are generally more complicated. In the manufacture of this instrument the black paper is wrapped about the system of glass reflectors which produce the optical delusion. These strips of glass, when thus arranged and fastened together, for the body of the kaleidoscope. The united reflectors are inserted in the pasteboard cover, and then the brass ring which secures the glass disks in the end is adjusted. Between the disks are placed scraps of colored glass, beads and trinkets, which tumble about as the kaleidoscope is revolved, and, when reproduced by the mirrors lining the tube, form themselves into those ever shifting and fantastic forms so familiar. The colored glass is broken into fragments by hammering and inserting between the plates, which are made fast by the brass ring. The kaleidoscope is then complete.

UNBURNT BRICK.—Much as many may dispute the fact, it is nevertheless true that unburnt brick form a much dryer wall than ordinary burnt brick, inasmuch as they are not so absorbent of wet or damp. To make these any ordinary clay will answer. If dry when obtained, it must first be moistened and thoroughly worked by the feet of cattle, or pounded by hand. Cut some straw into pieces about six inches in length, After being duly mixed with the straw the clay is ready to be made into bricks. A mold of any size may be made; this mould should have a bottom, but not air tight, in order to prevent the brick from sticking in the mold. The clay is put into this mold and the brick formed much in the same way as ordinary brick. Should the clay be very tenacious, a little sand sprinkled in the mold will enable the brick to leave it freely. The bricks are placed on level ground to dry, turning them on their edges on the second day; thereafter left in piles, protected from the rain, for ten to twelve days.

RAILWAY COLLISIONS.—A very important invention for preventing damage from railway collisions was shown at the International Forestry Exhibition in Edinburgh. The arrangement consists principally of a telescoping frame of tubes which runs from buffer to buffer, and which extends on each end of the carriage a considerable distance. If a collision occurs, these telescoping tubes gradually increase their resistance to the end of the train. The force of the blow is soon expended, and there are no splintered cars, and not a car off the track. A train with this equipment attached was started down a steep grade, and struck the stop block without a particle of injury, the train coming gradually to a stop. The invention, it is said, need only be applied to every third or fourth car.

A STAIN REMOVING SOAP.—A universal stain removing soap for use in bleach, print and dye-works is thus described in the *Moniteur de la Teinture:* "Take twenty-two pounds of the best soap and reduce it to thin shavings. Place the soap in a boiler with 8.8 pounds of water and 13.25 pounds of ox gall. Cover up and allow to remain at rest all night. In the morning heat up gently, and regulate it so that the soap may dissolve without stirring. When the mass is homogeneous and flows smoothly and part of the water has been evaporated, add .55 pound of turpentine and .44 pound of benzine and mix well. While still in a state of fusion, color with green ultramarine and ammonia, and pour into molds, where the mixture should be allowed to stand several days before it is used. The product will be found to act admirably."

CORDAGE and textile fabrics, as well as wood, leather and paper, it is claimed, may be rendered impervious by M. Dujardin's process. He takes of pulverized potash, alum and crushed acetate of lead, each 20 parts, bicarbonate of potassium and Glauber's salt, each, 12 parts, and pours over this mixture 3,000 parts of soft water, all by weight. There are also dissolved separately, in an equal quantity of water, nine parts of oleline soap, both solutions being then mixed. The articles are left in this solution until thoroughly saturated, allowed to drain, dried, brushed, and finally pressed. In the case of linen, leather and wood, six parts of margarine are added; and for cotton or paper some galatine, three parts, and six parts resin. Colors are not injured, it is stated, by impregnation with this preparation.

SEPARATING RAGS OF COTTON AND WOOL MIXED.—Heddebault has succeeded in separating rags of cotton and wool mixed, by subjecting them to the action of a jet of superheated steam. Under the pressure of five atmospheres, the wool melts and sinks to the bottom of the receptacle; while cotton, linen, and other vegetable fibers stand, thus remaining suitable for the paper manufacture. The liquid mud which contains the wool thus precipitated is then desiccated. The residue, which has received the name of azotine, is completely soluble in water, and is valuable on account of its nitrogen. Moreover, its preparation costs nothing; because the increased value of the pulp free from wool, is sufficient to cover the cost of the process.

THE USE OF CORK BRICKS.—This material a mixture of cork, silica and lime—is said to be a perfectly durable material, guaranteed not to rot. It has the advantage of keeping out heat and cold. It is light in weight and easily applied. An interior wall might be built of it where an ordinary brick wall would be too heavy, while it would be equally durable and substantial. It is nailed up to laths as a covering under roofs, or for ceilings, for wall linings, and for the under part of floors, as it is said to be an admirable preventivo of damp, and a deadener of sound also. It is stated to be coming into extensive use in Germany.

PRESERVING FRUIT.—If we put fruit in a vessel and exhaust the air, how long will it keep in its natural state? Theoretically the fruit would keep indefinitely, but it is an absolute impossibility to obtain any such vacuum, for the pores of the fruit are full of air. In canned fruits the cooking is supposed to destroy organic germs; the cans are boiled to exclude air, a final pin hole being left to this purpose to be sealed up last; but even this cannot be said to absolutely get out all the air, and so there is a limit to the keeping qualities of all canned goods.

TO EXTIRPATE MILDEW.—Mildew can be extirpated by a simple emulsion of one part of phenic acid in one hundred parts of water, in which soap is dissolved. The spray should fall above the leaves. The operation should take place in the evening, to avoid rapid evaporation, Some hours after spraying one will find the mortification of the tissues under the mildew spots and the drying up of the filaments.

GOOD HEALTH.

Pneumonia or Inflammation of the Lungs.

Inflammation and congestion of the lungs destroy the lives of hundreds and thousands who might have escaped if the preventive measures or the proper care of the person as herein suggested, had been known and attended to at the proper time. The facts given are of vital importance to all and should be carefully read and considered. We copy from Hall's *Journal of Health:*

Pneumonia or inflammation of the lungs is a disease that attacks suddenly; is always alarming, and, unless promptly and judiciously treated, is very fatal, particularly to persons over 50 years of age. Young persons usually recover from the inflammatory stage; but very many die, perhaps years afterward of lung disease, of which this was the commencement; hence the importance of knowing the conditions that are liable to produce the disease; the symptoms that denote its existence, and the best means of arresting a malady whose march is always rapid and destructive.

As to the conditions that are liable to produce the disease: A person who remains in a warm, but dry and well-ventilated room, long enough for the skin to become moist with perspiration, and then goes out of doors where the temperature is considerably lower, is liable to have an attack of *influenza* more or less severe, but the lungs usually remain intact. If, however, the room is *ill ventilated*, and many people are congregated together, as at church, a concert, or other assembly, the air becomes poisoned by exhalations from the lungs and bodies of those present, and, being re-breathed, acts as an irritant to the delicate tissues of the lungs, lessening their power of resistance to disease; under these circumstances, sudden exposure to cold is almost certain to be followed by inflammation of the lungs, of greater or less severity, depending on the age and vigor of the person attacked. It is perhaps within bounds to say that nine tenths of the premature deaths from diseases in this country are due to blood poisoning, caused by inhaling noxious gases in the place of pure air.

Pneumonia

Is an inflammation of the spongy tissue of the lungs. There are numerous varieties of the disease, depending upon its location and extent; but this is of little importance to the general reader. There are also various symptoms depending on the severity and location of the disease, or its complication with other maladies. It would require too much space to refer to these in detail, and we can only give such as are necessary to determine the nature of the complaint.

The First Symptom

Usually observed is a chill, soon followed by fever, labored breathing, severe pain in some portion of the chest—but more frequently about one inch below the nipple, over the lung most affected. This is the first or congestive stage of the disease; and, if the treatment is prompt and judicious, it ordinarily extends no farther; but when it enters on the next or inflammatory stage, it becomes formidable under all circumstances, and terribly relentless to those of advanced years, because the recuperative powers of the system are feeble.

Symptoms.

The signs that usually characterize the congestive stage of the disease, occasionally seem to be wanting or are not noticed, and the patient finds that he has, almost unconsciously, reached the inflammatory stage. But, although not observed, the disease has really passed through the first or congestive stage, though there may have been simply a feeling of weariness or an aching of the muscles to denote it. This second stage is characterized by increased fever, more rapid breathing, and more or less cough, followed by a little mucous expectoration, which soon increases in quantity and is stained with blood, so as to have a reddish appearance. The tenacity of the sputa is so great that it adheres to the vessel when turned bottom upward. This rusty-colored expectoration is the most characteristic sign of pneumonia. The disease seldom attacks both lungs at the same time, and more frequently occurs in the right lung.

In the Third or Suppurative Stage,

Portions of the lungs become hepatized, that is, like the liver, in density. These hepatized portions ulcerate and form cavities. This condition is extremely dangerous, particularly to patients who inherit a tendency to consumption. We have thus given an outline of the various stages of this dreaded disease. It is sufficient to put the reader on his guard against it: or, if not, he will be able to recognize the enemy and expel it before a foot-hold is gained.

Remember that pneumonia may be almost always avoided by a proper observation of the laws of health, and that, in its first stage, it is almost always curable.

WHAT THE DOCTORS SAY ABOUT BICYCLE RIDING.—Those who work the pedals of the graceful bicycle will, unhappily, find little to commend their favorite exercise in the columns of the medical journals. From time to time there have appeared the results of inquiries of the medical faculty into the effect produced upon the body by continued bicycling: and though a verdict may scarcely be said to have been rendered, the evidence presented proved, in some cases, sufficiently convincing to condemn the practice. The latest opinion on the subject is contained in a paper contributed to the London *Lancet* by Dr. S. A. Strahan, of Northampton. Neither Dr. Strahan nor those who preceded him on the subject condemn bicycling altogether, but when indulged in constantly and especially when the course traversed is rough or hilly, they agree that it leads to serious disorders of the whole generative system. Many cases could be cited where races have become almost totally impotent from immoderate equitation, as the Tartars, and partially so from the same cause, as the Indians. Like others who have written on the subject, Dr. Strahan speaks of the "disease of the Scythians," but does not tell us just what it was. We know that they were a warlike race and continually in the saddle, and can only conclude that he means this constant perineal pressure reduced them to the wretched condition in which Hippocrates tells us he found them. Hippocrates says: "Their bodies are gross and fleshy; the joints are loose and yielding; the belly flabby; they have but little hair, and all closely resemble one another." Yet bicycling is said to be ten times as severe on the perineum as riding.

UNHEALTHINESS OF NEW HOUSES.—The unhealthiness of new houses is due to the presence of moisture in their walls. This moisture may be held either mechanically, as by capillary attraction in the bricks, mortar and plaster; or chemically, in the hydrate of lime. Moisture held mechanically is removable by air and warmth; chemically-held moisture is removed gradually by the action of carbonic acid contained in the air. A writer in the *English Mechanic* suggests the use of a dew-point thermometer as a means of determining whether a house is sufficiently free from moisture to be inhabitable. If we take a reading of this in the open air, in the shade, and protected from wind, we have the actual atmospheric conditions. If we now transfer the instrument to a room in the house, which has been closed for a few hours and without artificial heating, we find the internal conditions. If the dry thermometer is lowered, we may conclude that the walls are cold, and so absorb heat. If the difference between the wet and dry bulbs is lessened, we know the evaporation conditions are also lessened; that is, that the internal atmosphere is overcharged with moisture. The two together will prove that the walls are damp, and that the house is disadvantageous to health.

VALERIAN FOR SUPERFICIAL WOUNDS.—At a recent meeting of the Societe de Biologie, M. Arrogan brought forward a new method of dressing wounds, by which, he declared, their healing was hastened and the pain was made to disappear at once. The method consisted in the application of compresses wet with a decoction of 30 parts of valerian root in 1,000 parts of water. Of 50 patients treated in this way, with only two had benefit failed to result, whether the wounds were lacerated or contused, but it is expressly stated that the treatment is of no avail in deep wounds. In one instance warm injections of the decoction were used for otitis media. The anodyne effect is attributed to the action of the valerianic acid on the terminal nerves, and an antiseptic influence also is credited to the remedy.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SUTTER CREEK.—Cor. Amador *Ledger*, Dec. 5: Work has been started at the Lincoln, quite a force having been put to work last Monday. Rock is being taken out, and the mill will be kept running steadily. Several tons of sulphurets have been sent to the reduction works. Mr. Valentine is here trying to make arrangements to start up the Mahoney. Over 100 tons of rock from the Wabash have been crushed at the Mahoney mill. I am told the clean-up was satisfactory.

RICH ROCK.—Amador *Sentinel*, Dec. 3: Rich rock is reported to have been struck in the Wetzlar claim, which joins the St. Julian. The same reports come from the Farrel mine at Middle Bar.

FIRE.—The hoisting works of the Tellurium mine of Pine Grove were burned, about 8 o'clock last Friday night, supposed to be from some accidental cause. The blow is quite a severe one to the town as the mine had but recently started up, was employing quite a number of men, and the ore was said to be looking well.

Calaveras.

MURPHY'S CAMP.—Cor. Calaveras *Citizen*, Dec. 5: Mining in the districts north of this place is being conducted on an economical basis and the developments are flattering. The Oro Minto, Enchantress, and Calaveras mines, are under the management of T. A. Goodwin, a practical miner of long experience, and also an owner in this group of mines, who is opening up the ore body lately struck in the Oro Minto—western extension of the Calaveras—disclosing a fine body of ore of that rich, bluish cast that at once determines its character. The Burleigh drill with its irresistible force is now at work in this western extension without intermission. The Enchantress is being worked by a shaft which has now gained considerable depth. Ore of exceeding richness has been extracted from time to time from this lode, which is of good width and more than fair quality. The Calaveras lies quiet on its laurels after uncovering an extensive body of ore on the 400-ft level, ready for easy extraction as soon as milling facilities permit. From these mines, principally from the Calaveras, gold closely approximating $300,000 bas been taken out in past years, and thousands will be taken out in the future. A recent crushing of 20 tons of quartz from the "Lost Kid" mine yielded the handsome sum of $650—$32.50 per ton. Some rich quartz is found in this mine. Fred and Charley Schworer are the lucky owners. Green's mine, located on Indian Creek Ridge, is placing itself on record as a paying mine. Nine ounces of gold was mortared out by hand during the week ending Nov. 22d. There is a shaft over 70 ft deep on the lode with favorable looking quartz at the bottom.

MILL.—*Mountain Echo*, Dec. 3: The 5-stamp mill erected some weeks ago by the Matson Bros. on their mine, about ¼ of a mile from this town, is being run steadily with good resnlts. The Matson mine, as previously stated, joins the Gold Cliff on the south and although the ore has so far proved to be of a low grade, there is such an immense body of it, and it is so easily obtained, that with proper machinery a fortune could doubtless be realized. The pay matter is of a talcose formation and more than fifty ft in width. Here is a chance for investment in a mine that will last for many years.

El Dorado.

THE INDEPENDENCE MINE.—*Mt. Democrat*, Dec. 3: We have had considerable to say about this property, which is in Cosumnes township and have predicted that when properly opened it would show up as one of, if not the best mine in the country. It has been under bond of late to a company of Cleveland, Ohio, capitalists, who placed it under the management of H. H. McClellan of Grizzly Flat, who thoroughly understands his business, and the mine was prospected. Last week the company purchased the property, and a full force of men have been put to work taking out rock. The mill, which has been overhauled and put in perfect order, is now making a run.

SLUG GULCH MINING.—Jos. Wigglesworth of Oleta, Amador county, was in town Monday. He says he has two men at work in the tunnel at the Ensley mine, in Slug gulch, near Fairplay, and that the mine is looking first rate. Mr. Ensley is expected here from Michigan shortly to give the mine his personal attention.

SPANISH CREEK LEDGE.—Jos. Gamblin has a 3-ft ledge in the Spanish Creek claim from which he has just taken about 100 tons of splendid looking quartz. The new 5-stamp mill was started up last Monday.

FOR THE MELTON.—Saturday last the new air compressor was forwarded to Grizzly Flat by H. S. Morey, for use in the Melton mine. This compressor is capable of operating three three-inch National drills, it having a twelve-inch cylinder and twenty-inch stroke.

Kern.

KRAMER DISTRICT.—Cor. Calico *Print*, Dec. 5: The outlook for the camp is becoming more favorable every day. There are a number of prospectors in this vicinity now, and they keep the Recorder of our district busy making record of their locations. W. E. Moore is working on the Belden. Messrs. Mace and Baker are prospecting. Mr. Baker thinks he has found a bonanza silver ledge. He has located 3,000 ft on it. We are down 22 or 23 ft on our gold ledge and it is turning out some very good rock; it is all good, in fact. One assay went, in gold, 544.92 ounces; in silver, 100.06 ounces. It is not all as rich as this.

BEVERIDGE ITEMS.—Inyo *Independent*, Dec. 6: The miners of Beveridge district had a meeting last Monday and elected Thomas McDonough, recorder for the ensuing year. The former by-laws of the district were adopted, with the exception that the fees for recording claims and for certificates of work done were reduced to one dollar each. Laskey's mill is running on ore from the Keynote mine. The results are satisfactory to all concerned. The new wheel and pans put in at the McDonough mill work well; the prospect for the mill is excellent. Some change is being made in the gearing that will increase the capacity of the mill.

Mono.

A SWEETWATER SALE.—Virginia *Enterprise*, Nov. 30: Colonel A. C. Ellis, of Carson, has sold his intercst in the Lookout mine at Sweetwater, Mono county, California, to Alexander Kilpatrick and other Bodieites, who will at once proceed to develop it in a comprehensive manner. Kilpatrick left here a few days ago on a visit to Scotland on both business and pleasure. It is probable that the journey is connected in some manner with the late mining transaction. Some months ago Joseph Wells and himself built a 5-stamp mill in Silverado Canyon, Sweetwater, which has turned out so favorably that they "want some more."

THE MONO STRIKE.—Bodie *Free Press*, Dec. 3: The skeptically inclined are informed that the Fortuna vein disclosed at the recent strike in the Mono has widened out several inches; assays as high as $750 and $800 per ton, with the lowest at $250; ore vein over a foot thick; bas firm, clean walls, is a ledge and not a pocket. It is cut 125 ft in on the Mono ground from the boundary line of the Bodie. The ore can be taken out of the Lent shaft at only the cost of running the works. This is from personal observation and official authority.

Mariposa.

HORNITOS NOTES.—Cor. Mariposa *Gazette*, Dec. 6: Old residents are well aware of the fact, turn wherever you may, you will find old '49ers sticking to their claims, hoping and waiting for the millenium. Go in the deepest canyons, climb on the highest ranges, you will meet with men who have seen Mariposa in its golden days, and who will tell you of veins of untold wealth, hidden only a few feet beneath the soil, and lying idle on account of that "cursed grant." Of rich placer diggings waiting for the end of that litigation. Now and again, some obscure miner, long since forgotten by all, will pass through our town on their way to "Frisco," with lumps of gold, clandestinely extracted from the ground. Not later than last week, some of the finest and largest specimens of pocket gold that my eyes ever looked upon, were shown me by a friend; they were from your part of the county. After long years of toil and perseverance he "struck it," and one hour's work enriched him for life; and this is no fable—no visions of a diseased brain, ill with dreams of the impossible. Some of these specimens are still here, speaking for themselves, and attesting the validity of the fact that ours is a region yet wondrously rich. Under the management of the new company, the Quartz Mountain mine will start again with a new lease of life. It is one of the best mines around Hornitos. Some years ago, after changing hands several times, being left in debt with a bad name, Quartz Mountain showed itself in its true colors. A half dozen miners took it to work out the wages due them by fraudulent managers. Four months were enough, and out of that much abused and despised Quartz Mountain, from a hole hardly scratched in its sides, I saw as much and as fine and good paying rock as ever I saw in big, much bragged of mines. At the present time Mr. M. Rogers, of the Washington Mine, and one of the principal shareholders, is superintending the removal and putting up machinery, and in a very few days quite a number of men will be at work on the place. An invitation was tendered me this morning to ride over over and visit, what was once the richest placer diggings in this vicinity, the Old Morillo Camp. The whole flat has been turned inside out, and by following foot by foot the rich deposits of auriferous gravel, they came to the mother lode. This is a very fair vein now open and laid bare for a depth of twenty-five or thirty feet, showing itself clean and bright, and well-defined for an extent of 1,500 feet, with a varying thickness of from six to eighteen inches, dipping at an angle of 45 degrees, and increasing in size as it goes. Wherever worked, it shows free gold to the naked eye and an abundance of sulphurets. The present owner—Mrs. Merck—has a small force of men at work baring the vein, and the prospects are very encouraging. Very rich rock has been formerly found by previous owners. At a distance of, say three-quarters of a mile, lies another mine, the property of the same lady. This is the "Three trees." Three venerable oaks grow near the mouth of the shafts, grim watchers over the treasure within, and reminding one of Dumas' famous triangle. At a depth of ten or twelve feet, the vein lies exposed from two to three feet wide, thirty feet long, with an indefinite amount of it to be yet worked, good paying quartz ready to be carried to the mill, rock averaging nearly $35 per ton, rough estimate.

Nevada.

IN FULL BLAST.—Nevada *Transcript*, Dec. 5: The Texas quartz mine is now in full blast and the indications are that it will make a big showing before many weeks have elapsed. All the work is being pushed ahead with commendable energy which is characteristic of the owners of the plant. If the Texas proves to be what miners generally thinks it will, there will be a big boom in the Willow valley section. The Hussey mine, which is known to be one of the richest in Willow valley, is still closed down on account of disagreement between the owners. There are ten or twelve claims in Willow valley on which work is being vigorously prosecuted, and in about every instance the developments are of a most satisfactory nature. Some of them are producing enough gold to at least cover the expenses incurred in opening them up. The Providence (very appropriately nicknamed the "Old Reliable") still maintains its reputation as being one of the best mines in the State. It produces with about the same degree of regularity that the world turns around, and its affairs move along without interruption or excitement of any kind. Ragan & Baldridge have the new pumping and hoisting machinery on their claim at old Coyoteville now running in good shape, and are rapidly opening up the ledge, which continues to improve as it goes down. The Mountaineer, which for a long time had a checkered existence, but is now owing to the perseverance and good management of the owners a steady dividend payer, shows new signs of permanent richness with every day's work done. E. Hothersall is having some work done at his claim on Deer creek just above the Providence. That bids fair to be one of the good mines of Nevada City when it has been fully developed. Every few days we hear of marvelously rich specimen ore being found in the depths of the Wyoming. About this particular time a fine lot of it is being brought to the surface. J. C. Locklin will this week start up the hoisting and pumping works he has been building on Chapman's ranch. Michell, Martin & Co., who were a few years ago enjoined from hydraulicing, discovered at about the same time the papers were served upon them by the Deputy U. S. Marshal a good looking quartz ledge that they had not previously known of. Since then they have been engaged in prospecting it and it shows up well. R. E. Robinson & Co. have a splendid prospect at the old Blum & Curry claim. They have ordered a Huntington mill. It will probably be here and in operation this month. At the Charonnat everything continues to look well. The ledge which has of late shown great improvement is yielding large quantities of excellent ore.

PUSHING THE WORK.—*Transcript*: Dec. 7: Work is being pushed ahead with rapidity at the Secret Treasure and Cornucopia mines in Washington township, and it is expected that the ten-stamp mill will be completed and ready to start by January 15th. Some 25 men are engaged in building the mill, erecting flumes, etc., and 15 or 20 more will be put on as soon as room can be made for them. Most of these things are being done by contract. The machinery will run with free water, that used by the Lindsay company being taken up after it passes their claim. It will require 1,400 feet of flume and 1,000 feet of pipe to bring it in, and a fall of 340 feet will be had, giving enough power to not only run the mill, which is to be increased to 20 stamps in the spring if everything goes well, but also the hoisting and pumping works which the company contemplate putting up next season. The consolidation consists of four claims, from all of which the extraction of ore will be begun this winter through tunnels, 1,500 feet of track leading from the various tunnels to the mill and being provided with cars for the transportation of ore.

SINKING FOR A LEVEL.—The new hoisting and pumping machinery on the Texas mine runs like clockwork, and Supt. Tilley has as many first-class miners and surface men employed as can be used to advantage in the present advanced stage of development. The shaft is being sunk from the drain tunnel (70 feet below the surface) at the rate of five feet every 24 hours, and when it has reached a total depth of 175 feet, levels will be run east and west on the ledge, 500 feet in each direction, so as to thoroughly prospect the ground. Some splendid ore is being taken from the ledge in sinking, and the future of the Texas looks exceedingly bright.

ANOTHER QUARTZ MINE DISCOVERED.—Wm. Floyd, ex-Superintendent of the Merrifield mine, his brother Thomas and Henry Ayers have for some time past been prospecting a quartz ledge not far from Delos Calkins' house on Selby Flat, and are now down on it a distance of 60 feet where it is about 24 inches thick. They have had two crushings, realizing from $12 to $14 a ton. It pitches into E. D. Dean's land, and the owners gave Mr. Dean a quarter interest in it for letting them work it out in that direction. Thursday Henry Richards bought Mr. Dean's share. By running a tunnel 300 feet long backs of 75 feet can be obtained. The owners propose to erect machinery before long and push the development of the property which gives every indication of being very valuable.

DRIFT MINES.—Nevada *Transcript*, Dec. 5: R. P. DeNoon, ex-superintendent of the Derbec mine, arrived in town Tuesday after having visited a number of the rich drift gravel claims at Damascus, Iowa Hill, Forest Hill and other places in that part of Placer county. According to his account, the gravel claims there are immense in extent and richness. In one claim over $200,000 clear profit was realized during the past year, and there were many claims where the gravel pays $7 and upwards per load. He regards the future of that country as unusually bright. Mr. De Noon is on his way to Bloomfield where he goes to superintend more work which he is having done on his drift claim at that place.

MORE CAPITAL FOR WASHINGTON.—Nevada *Transcript*, Dec. 5: John Pattison arrived here from San Francisco Wednesday evening and yesterday morning left for Washington. Since his last visit there, just before election, he has effected the sale for other parties of a very promising quartz claim lying near the Eagle Bird mine, San Francisco capitalists being the purchasers. One of the new owners came up with Mr. Pattison Wednesday evening, and is now at the mine making arrangements for running a tunnel and doing other prospective work between now and next spring.

Placer.

RICH PAY.—Placer *Argus*, Dec. 4: We are very glad to have it to announce, on excellent authority, that very rich pay has been struck in the May Flower mine, near Forest Hill. We have no particulars beyond the fact that they have it in all shapes—nuggets, coarse gold, and fine gold. Messrs. Slosser and McCullough have been getting rich gravel in their claim on the Middle Fork. A new amalgamator, the patent of A. C. Bowen of Michigan Bluff, has lately been put in use at the Rising Sun quartz mine, near Colfax.

Plumas.

OPHIR CON.—Greenville *Bulletin*, Dec. 3: The drift which was being run in a soft foundation along the side of the ledge in tunnel No. 3, has all come into quartz. The ledge has widened at least three ft in ten. A shaft has been sunk in the tunnel, on the ledge, which widens one foot in five downward. Five hundred feet up the mountain, and on the line of the vein, the ledge has been struck a few feet from the surface. The rock is of a fine character, although not so rich as some of the rock in the lower level. Mr. Hall says he is well pleased with the prospect. The water has nearly all drained out of the Bonanza mine. He will resume work on it. Geo. Standart started the Arcadian mill Monday on ore from the Ano mine.

THE PLUMAS CON. M. CO.—Plumas *National*, Nov. 29: This company has been making some substantial improvements at Onion valley and Sawpit, this fall. Under the superintendence of Mr. Samuel Kingdom, they have built a substantial dam across Onion valley, 850 ft long, 60 ft wide on the bottom and 17 ft high, covering 45 acres of land. There are three ditches conveying water from the reservoir to the company's ground at Sawpit and Richmond Hill, that have a capacity of 4,000 inches. The water will be used for both hydraulicing and washing drift dirt. The company will also furnishing Buckeye Co. with water, they having an immense lot of drift dirt ready to wash, supposed to be very rich. The Plumas Con. is a foreign corporation, and is managed by J. H. Thomas, one of the most energetic and enterprising miners in northern California. Several of the stockholders from Scotland are at the company's mines now, and seem highly pleased with the outlook.

Shasta.

IGO.—Cor. Shasta *Courier*, Dec. 3: The Hard-scrabble mine is now being put in order for the winter's run. Most of the arastras on South Fork are running on fair ore, and as soon as rain comes there will be considerable placer mining carried on.

IRON MOUNTAIN.—*People's Cause*, Dec. 1: Dr. Cameron, who has just returned from the Iron Mountain mining region, brought down with him specimens of ore which he informs us will assay $4,000 per ton in silver. W. A. Pryor has sent us several fine specimens of Iron Mountain ore which will assay probably $250 per ton in gold, silver and copper. The mines of this region are said to be of fabulous richness and from present indications it would seem that the real wealth of old Shasta in gold and silver-bearing quartz is just beginning to be discovered.

Siskiyou.

ETNA ITEMS.—Yreka *Union*, Dec. 4: The mines still look well. From the Klamath mine we hear that the mill started up sixteen stamps on the 25th ult., with a bountiful supply of good rock. Great credit is due Supt. Jas. Tonkin in making this mine a paying institution, as it was regarded as a bad "spec," when its present owners purchased it; and its productiveness at this time is due solely to the able management of its superintendent. One of the best, if not the best, claims on the north fork of Salmon is the A. Meier & Co. claim, situated on Paradise flat. Some time ago one of the partners, Chas. Kuchenbuch, sold out to Jos. Smith, an old pioneer, for $2,500. After the first three weeks' work Mr. Smith realized $300 as his share of the proceeds; and as they have lots of the same kind of ground left, Mr. Smith thinks he has struck a bonanza, and is thinking seriously of buying out Flood & O'Brien. At the Black Bear they are storing up quartz, awaiting for crushing purposes. Messrs. Campbell and George Smith have had a flying trip to Summerville to visit their mining properties there, under the direction and co-partnership of their superintendent and co-partner, Mr. Spooner. They report the ditch work, bringing water from the south fork, being actively pushed, and anticipate great assistance from the extra water thus acquired.

Tuolumne.

SOULSBYVILLE.—Cor. Tuolumne *Independent*, Dec. 5: Mr. D. Gibbons is at his mine, near Cherokee, and is going to haul his rock and have it crushed at Williams' arastra. Mr. Shine is interested with him. Everyone seems to feel good at Soulsbyville, because, they say, the old mine looks fine—plenty of rock, and good at that. They have been sinking the shaft for some months past, but have got it down and have commenced drifting north and south, near the bottom, and will, no doubt, in a short time have one of the best mines in the State. It has been rumored several times that it would peter out, but it has been one of the best mines in the county (as we all know) and is good for 20 years yet. It is rumored that they are repairing the old Louisiana mill, in view of crushing some of the Dead Horse rock.

San Bernardino.

SILVER ODESSA.—Calico *Print*, Dec. 6: The Silver Odessa in East Calico is looking exceedingly well, especially for a mine that was supposed by those not familiar with the "tactics" of mining operations, to be "played out." A tunnel several hundred ft in length has been driven through the hill, which follows the meanderings of the principal ore vein. The lower end of the tunnel is at the south-east end of the hill near the brow of the steep and craggy bluff that forms part of the west wall of Deep canyon. From this end a new tramway and car track will be built shortly, which will terminate at a large ore bin in the canyon below. At brief intervals in the tunnel can be seen small seams of very rich ore which widen every few ft into pockets of black metal, chloride and horn silver. At numerous points prospect drifts have been made, all of which penetrate ore. There are also several cuts and openings in the east side of the hill from which considerable fine ore is being taken. The ore body extending through the hill is 40 ft wide. The ore is being assorted and screened, and none that will yield less than $100 to the ton is now being hauled to the mill, and a good portion of it goes as high as $160 to the ton. Five tons of this kind of ore are being taken to the mill daily. The ore of a lower grade will be milled when the $100 rock becomes scarce. There are several shafts in the mine from 20 to 30 ft deep which are showing up well. The mine is in a most promising condition and the managers are well pleased with its prospects.

NEVADA.

Washoe District.

HALE AND NORCROSS.—Virginia *Enterprise*, Dec. 6: Although some small openings have been made at two or three points on the 2800 level it appears as yet no regular working cross-cuts have been made. Now, however, they are clearing at these points and putting things in shape to start permanent crosscuts. The main winze had yesterday reached a depth of 83 ft below the 2900 level. This leaves but 40 ft to go (on the slope) to reach the 3000 level. Nothing is at present being done on the 2900 level, though the station at that point is completed and all is in readiness to begin explorations at that point. No drifting will be done there, however, until the new hydraulic pump has been started up. The Chollar people ask the Hale and Norcross folks to run no crosscuts and take no chances of letting in a flood of water until their pump is in working order. A little injudicious drifting at this time might flood the 3000 station and do almost incalculable damage.

SIERRA NEVADA.—The west crosscut on 3000 level, 80 ft north of the joint winze, has not yet cut anything of more value than was found in the drift. Some small seams of quartz have been cut, but they show nothing more than a trace of metal. In accordance with orders from below, work will be suspended on the 3300 and at all points below the 2700 level,

OPHIR.—Work has been resumed in the face of the west drift on the 500 level. The ground is now more firm and the drifts can be advanced without difficulty. The usual progress is being made in the west crosscut from the main south drift on the 1500 level. The ground presents a favorable appearance.

ALTA AND BENTON.—The works have been shut down. It was found that the water could not be handled with both pumps and tanks running at their best speed. To endeavor singlehanded to drain the whole country was found to be a useless expenditure of money. When the water reached the 1850 level, where the pumps were still in working condition, it was not considered advisable to start them up. The water was therefore allowed to take its course, and it is now somewhere between the 1850 and the 1750 levels.

UNION CON.—At the 3300 station of the joint Ophir, Mexican and Sierra Nevada winze they have been running a diamond drill hole to the northwest, but owing to the great flow of water tapped work in that direction was discontinued day before yesterday. In accordance with instructions from below all work below the 2700 level will be suspended in these mines and the pumps, air pumps and car tracks will be hoisted out.

ALPHA.—Quite a large body of quartz has been opened into on the 900 level. This quartz is of a very promising appearance and yields some good assays. Spots are found that assay as high as $60 a ton. It is hoped that somewhere in this body of quartz may be found a breadth of ore sufficiently rich to pay for extraction. The ore would only require to average about $12 per ton to pay well for milling.

COMBINATION STAFT.—The big station a few feet below the 3000 level, 25 ft wide, 80 ft long and 14 ft high, is now nearly completed. By to-night the last set of timbers will probably be put in. The foundations for the big pump are all in place and the first piece of the new hydraulic pump was sent down day before yesterday. By to-night the tank station will also be completed.

CALIFORNIA AND CON. VIRGINIA.—The usual progress is being made in the northeast drift on the 1750 level. As yet no cross-cuts have been run on this level. As it is running diagonally across the vein it is in itself in a manner a cross-cut.

ANDES.—The cross-cuts east and west from the north drift are presenting a favorable appearance. The west drift, which has been in hard porphyry for some time, is now passing into more favorable ground.

SAVAGE.—The E-street tunnel is now about to the point where it will encounter the northern continuation of the ore body that is being worked in the Hale and Norcross.

SCORPION.—On the 500 level the north drift continues in vein porphyry, with occasional streaks of quartz and small seams of clay. Not much water is encountered.

YELLOW JACKET.—A considerable amount of low-grade ore is being extracted and the usual exploring work is being done for the purpose of opening up new ground.

BEST AND BELCHER.—The west cross-cut on the 825 level is now in more favorable ground. It appears to be cutting into the ledge of the vein.

BELCHER.—A considerable amount of ore that will pay a fair for milling is being taken out, and the usual prospecting work is being done.

OVERMAN.—Are extracting about the usual amount of ore from the old upper levels, which ore is being worked at a mill on the river.

GOULD AND CURRY.—On the 825 level the west cross-cut is still finding mineral-bearing quartz of a good appearance.

UTAH.—The southeast drift on the 1950 level is in porphyry, with some seams of clay and stringers of quartz.

CROWN POINT.—About the usual quantity of ore is being extracted and sent to the mills.

Bristol District.

PROSPECTING.—Pioche *Record*, Nov. 29: Since the closing of the furnace at Bristol for the winter the workmen have nearly all gone in search for work at other places, while many have crawled into their prospect holes in the hills, where they will pass the winter searching for the hidden treasure, and will scratch the bowels of old Mother Earth with pick and drill, in their endeavors to force her to surrender some of her precious metals from her immense storehouse. Yet many of the millionaires are clinging to Bristol, and just so long as the residents of that town permit their coops to remain unlocked at night, just so long will these millionaires camp there and feast on chicken broth at the spa' wee hours of morning. They will stay by the pots as long as she boils, and that is right.

Centrasville District.

NEW MINES IN NYE COUNTY.—Eureka *Sentinel*, Dec. 5: John Capuro, of Virginia City, is in receipt of a letter, dated Centrasville, Nye county, Nov. 20, from John Centras, who writes that he has opened two valuable mines called the Good Luck and Belvidere. The Good Luck has three shafts, sunk 90, 85 and 40 ft in depth. The ore body in each, he says, averages from five to seven ft in width. The Belvidere lies parallel with the Good Luck, and has a tunnel 50 ft in length, with an ore body in the breast four ft in width. There are also two shafts in the Belvidere, 20 and 25 ft in depth, with ore bodies averaging six ft in width. Three and a half tons of ore taken promiscuously from the ore bodies in the different shafts and tunnels were recently shipped to San Francisco for reduction, and the returns netted $189 per ton in gold and $4 in silver. These mines are situated in Nye county between Ione and Grantsville, about five miles from each of the above camps. The new camp is named Centrasville after the discoverer, John Centras, formerly of Virginia.

Central District.

MINE BONDED.—*Silver State*, Dec. 7: Peter Woolcock has bonded the Fifty-six copper mine, which is situated west of the Humboldt river, near the southern end of Central district, for $50,000. The vein is large and easy of access, and carries considerable ore of a high grade. Mr. Woolcock is an experienced miner, and thoroughly understands copper mines and ores, and associated with him is a San Franciscan named John Bryant.

Garfield District.

MINING SALE.—Virginia *Enterprise*, Dec. 3: It is reported that the Farrington brothers, of Garfield district, on the line of the Carson and Colorado Railroad, have sold one of their mines to an English company for $950,000, and that Archie Farrington has gone to Europe with several members of the company, who came out here to examine the property, for the purpose of obtaining the purchase money. It is said there is more than $1,000,000 worth of ore in sight in the mine, which has been constantly improving in prospects ever since the Farringtons took hold of it. They went to Garfield "without a bean" three or four years ago, and are now rich, solely by dint of pluck and industry. The mine just sold is about twenty miles from Hawthorne and twelve miles from Soda Springs, on the Carson and Colorado Railroad, situated in a magnificent mineral country, which has hardly been touched by prospectors.

Mount Cory District.

TOO MUCH WATER.—Walker Lake *Bulletin*, Dec. 3: J. L. Stoner has had several men at work on the Silver Brick mine at Coryville for some time. Some time ago a large stream of water was struck in the face of the tunnel, and it is thought that work will have to be suspended for awhile.

THE NORTH STAR CON.—Considerable work has been done of late in the North Star Con. mine at Coryville. The face of the drift has been cleaned up and it leaves the ledge exposed in a very satisfactory shape. The tunnel has been extended about thirty-five ft beyond the ledge where a small vein of very rich carbonate, assaying nearly $500, was struck. It begins to look as if the boys were to be rewarded for their industry.

Reese River District.

AN OLD MINE REOPENED.—Cor. Virginia *Enterprise*, Dec. 7: The Naiad Queen, one of the oldest mines in this district, abandoned long years ago from superabundance of water, lack of proper facilities for working, and other natural causes, has recently been relocated, and is being reopened in good and promising shape, by Nye, Samson & Co., some of the oldest and best experienced miners in the Lander Hill ore belt. The Naiad Queen is situated a few rods in the rear of the Manhattan mill, and directly beneath the bed of the main ravine, or Pony canyon. Its former owners and developers worked it to the depth of about 175 ft, more or less, and had a very good-sized and promising ledge of ore, but, as before stated, having too much water to contend with, and lacking the proper facilities for working, they could not make it pay, and were finally obliged to quit. The present proprietors have erected very neat and effective steam hoisting works, and are pumping, clearing out and repairing the old incline, preparatory to a well-organized raid upon the long-neglected and abandoned ledge. Thus it is that old mines, abandoned by the early settlers and locators, occasionally, even yet, find men of judgment and experience, with sufficient enterprise and ability to reopen and develop them.

Tuscarora District.

BASIN MINE LEASED.—*Times-Review*, Dec. 3: Matt Chambers, John Dougherty, Harry Cannon and Joseph Hall have leased for six months from Mr. Price, 125 ft of the Basin mine, which they are privileged to work to the depth of 50 ft. They are sinking a shaft on the ledge about the center of the claim. The ledge is gold-bearing quartz which assays fairly all the way through, while there are bunches and streaks which are exceedingly rich. There is a considerable amount of other good ground in the district which could doubtless be leased upon favorable terms.

A DIVIDEND PROPOSITION.—There will probably be another dividend declared on Navajo to-day or to-morrow. Local holders are not worrying over the decline of the stock in the Board, as they are confident of the continuation of dividends to an amount considerably in excess of present quotations. Fortunately the manipulations of operators in San Francisco cannot effect the bullion-producing properties of the mine, nor the consequent profit occurring from that, and the judicious management at this end of the line.

Taylor District.

MONITOR.—White Pine *Reflex*, Nov. 29: This mine is just now opening out big in two places. In the incline, west of the Spar Chamber, which has been sunk 25 ft, a body of ore has been struck which at the time of our visit Monday last had opened out to between eight and ten ft. Assays show the ore to average $100. Three ft of chloride on the bottom goes $150. There is also an iron-looking rock mixed up with it that assays as high as $400. This strike looks like a second floor. In the south drift another fine body of ore has been struck which was all of eight ft wide at the time of our visit and still widening. Assays from the top show the ore to go about $125 to the ton, while three ft of chloride on the bottom goes $180. We learned yesterday that still another strike had been made on the west side of the ravine, and that a large body of rich ore is now exposed.

ARIZONA.

NOTES.—Prescott *Courier*, Dec. 3: The talk is that something will soon happen in Copper Basin. Hope so. The new mill in Humbug district is running. There is a rumor that it is paying. We have three first-class assaying firms and they are kept pretty busy. A great many people continue to think that the Tiger is one of the finest mines in Arizona; but it is a sad fact that owners have not sufficient capital to prove the faith that is in them. Bond & Hayden and E. S. Junior keep right along developing properties in Bradshaw district, and, we learn, will be able to do some crushing next spring. Humbug district-chloriders continue to take out good silver ore, which is shipped to Benson. All accounts agree as to the success which accompanies these men, who work with small capital, and are their own bosses. Turkey Creek district ought to be shipping more ore. They have it, rich, and should not keep it where it is not doing much good. Freighters take ore from the Dosoris to Ash Fork for seventy-five cents per hundred pounds. We would welcome the coming to Arizona of Colorado, Montana, California and Nevada miners, who would take right hold and be their own capitalists. We wish capitalists would send out experts to test such gold-bearing ledges as the Dividend, Galena and Ticonderoga, of Big Bug District; the Gray Eagle and California, of Bradshaw, and many more ledges we might name, which carry gold, and are large, strong veins. If we are to keep on shipping ores to smelters in Colorado and other places, the sooner we provide for concentrating our ores the better it will be for the Territory. It costs too much to transport ores from places near Prescott to Pueblo and Denver; the cost is so great that none but the richest of ores can be mined, sacked and sent away with profit. In this emergency, it behooves our miners to concentrate, so as to reduce bulk and save, for shipment, what is really valuable. In this connection, we are somewhat anxious to learn what will be done at Big Bug, where a mill and concentrating machinery are in process of erection. With concentrating works in every district, the mining riddle would soon be solved in a satisfactory manner. Without them, not much progress can be expected until general reduction works shall have been erected at some point in these mountains.

A GOOD MINE.—*Silver Belt*, Nov. 29: The Fame silver mine, on Quartzite hill, promises to become one of the rich producers of Globe District. Mr. Charles Hayse, one of the principal owners, informs us that there are now about 800 tons of ore on the dump, which will assay from 50 to 1000 ozs. They are now working only a small force of men, pending the purchase of a mill which they expect soon to erect at the mine. When that is done the working force in the mine will be increased, as the present showing justifies it. The mine is worked on an economical plan, there being no hoisting to do; four tunnels have been run into the hill, and in each there is good ore. The ore is very tractable, being chloride and very free milling. The vein now being worked is about three feet, and recently some very rich ore has been taken out. There is an abundance of wood in the vicinity, and a fine well of water close to the mine, and with a mill on the ground the ore can be worked very cheaply.

PROBABLE SALE OF A MINE.—*Sunshine and Silver*, Dec. 3: The Mammoth gold mine, in the Santa Catalinas, owned by Messrs. Goldtree Bros., Schultz and Dr. Matas, has been bonded for 30 days to eastern parties, represented by Mr. Fletcher of Denver, now in this city. The sale, which is for $22,000, including the cannon ball mill, is contingent on payment of the first installment of that amount on January 1st, the balance to be paid in three and six months. If the sale be consummated, of which there is little doubt, the purchasers, who are solid capitalists, will immediately commence the erection of a 10-stamp mill on the property, and develop it in a systematic manner. The trade was negotiated through T. D. Reymert of the *Index*.

TOMBSTONE ITEMS.—*Epitaph*, Dec. 7: Chloriders on the Bob Ingersoll are taking out fine pay ore. Another carload shipment of fine ore from the Ground Hog has just been made. With the completion of the new Atlanta hoisting works—Bisbee—it is expected an additional force will be put in the mine. On the Independence work is still progressing with a good showing, the upper shaft being now down nearly 70 feet, and the owners justly well pleased with the outlook. During the past few months the owners of the Elgin, in the Turquoise district, have been prosecuting development. The shaft is now down 70 feet, and a large body of ore followed to that depth. The ore body on the Old Guard still holds its own in regular output, while the ore is said to have increased in value, and as the last shipment assayed $180 to the ton, higher grade is very flattering. Our prosperity depended upon pumps, for the ore is below the water sure. The pumps are a fixed fact, and the prosperity of Tombstone ditto. Latest reports from the Great American (Swisshelms) are most encouraging. The mine is showing well, the new camp is growing rapidly, and indications from work progressing, point to much additional wealth in that district. The cheerful information published by the *Epitaph* yesterday that a contract had been let for the Grand Central pumps, has had a noticeable effect upon our business men. Their faces are now wreathed with smiles, and they now feel that they have not lived in Tombstone in vain. Owners of mines in the district are jubilant, and predictions of great prosperity for our camp are everywhere heard. If it were not for using a hackneyed word, the *Epitaph* would remark that we are on the eve of a boom. Let it come.

COLORADO.

CRYSTAL CITY.—Elk Mountain *Pilot*, Nov. 29: The Black Queen is looking finely, and the lessees shipped 4,000 pounds of ore to the Moffat smelter last week. The fine weather we are having is of great advantage to us, as the road is getting passable to Crested Butte. The Milwaukee lessees are about cutting the right hand vein, and specks of mineral are scattered through the rock. The Mountain Chief is showing up a larger quartz streak than at the commencement of the present contract. Robinson and Ring are running a contract upon the Challis Rock Creek tunnel site. Al Edwards has just completed his assessments in Hat mountain, and has some nice-looking ore. The Belle of Titusville is improving splendidly with development, and the lessees have a 5 to 8-inch streak of rich ore in the face of the drift, which carries some fine wire silver. By spring they will have quite a large pile of ore ready for shipment, which will mill from 100 to 150 ounces silver to the ton. Anderson and Perham have completed their work on the Orphan Boy Mining Co.'s property. Assessment is being done on the Bullion, which is showing a small amount of galena.

THE COAL MINERS' STRIKE.—The coal miners' strike throughout the State is liable to prove more disastrous to the labor interests than at first thought. So far as we can learn, the miners of this place have no cause for a grievance, as their pay is sufficient, and there is no reason that our men should be forced into a strike along with other coal miners belonging to the Union Pacific, and others in the northern portion of the State, who may have grievances.

IDAHO.

THE SULTAN.—Idaho *Keystone*, Nov. 29: Ole Rorem, of the Sultan mine, was in town this week. There will be no work done on the mine this winter. Supplies have been laid in for early spring work, and a force of miners will be put on the mine as early as March 1st. The last lot of ore came down yesterday and was unloaded at the warehouse of T. E. Clohecy & Co., from which place it will be shipped to the Omaha smelters. The Sultan is one of the finest prospects on the mine. Rich ore begins in the grass roots. The ore shipped this season has netted, on an average, about $180. The ore is steel galena, carbonates and gray copper, and contains, with the silver, from one to two ounces of gold per ton.

BAYHORSE.—A short time ago the Dougherty brothers struck rich ore on an old location near town, which created quite an excitement. J. J. Jarvis located the eastern extension of the Dougherty claim, and with little labor struck one of the richest veins ever found in the district. The ore is chloride and galena, and assays from 150 to 750 ounces. The main body of the ore varies in width from one to three ft, while with it is a vein of white quartz three to five ft wide. The Martin brothers located the next extension of the Dougherty lode, and found the same pay streak that Jarvis has, but not so much of it. The Martin location contains more gray copper than either of the others. The Smelter Company are putting in steam-power machinery, and it is the understanding they will immediately commence the erection of a refinery. There is a large force of carpenters at work for the company on their different improvements and buildings. The smelter runs as steady as a clock, producing much high-grade bullion. Dave Wood's Excelsior mine is too big to talk about. It is simply immense. The Ramshorn has 100 men employed; the Post Boy about 20; the Skylark and others have full forces of men. Everything looks life-like about the camp, and by spring we will have the biggest boom that has yet struck the Salmon River country. Business generally is good, and roads in fine condition for freighting.

MONTANA.

IMPORTANT MINING SALE.—Butte *Inter-Mountain*, Dec. 4: Yesterday Henry Gassert and Jacob Reding, of Butte, sold to Ferdinand L. Van Zandt, of San Francisco, and Stephen A. Fleming, of Butte, the Blue Bird lode and the Mono No. 2 lode, situated in this county, (Independence mining district) for the consideration of $100,000, of which amount $30,000 has been paid and the remainder ($70,000) is to be paid in installments of $10,000 every three months. The developments upon these properties at present consist of several shafts, the deepest of which is down 115 ft. The veins are strong, and the ore generally milling and rich in silver. It is the purpose of the purchasers to at once make preparations for thoroughly exploring the properties, with the view of ultimately putting up works for the extraction of the precious metal.

OREGON.

RICH MINES.—Dalles *Mountaineer*, Dec. 5: In conversation with Mr. R. W. Crandall, who is one of the owners in the new quartz mines in Union county, we learned that the ledge was first discovered by his brother, Mr. D. W. Crandall, in 1866, who took some specimens and had them assayed. No further attention was paid to the matter until the summer of 1881, when Mr. R. W. Crandall, of this city, started on a tour in the mining region of Eastern Oregon to find the lost ledge. Arriving at Union, he found a man who was with his brother at the time of the discovery who felt sure he could go straight to the ledge. Mr. Crandall found every indication of rich croppings. He spent the whole of that summer in opening the mine, and tracing its extent. Satisfied with the ledge as exposed, Mr. Crandall gave the three following summers to developing the mine. He has sunk shafts to a considerable depth, and found that the rock is very extensive. There is one stratum of ribbon quartz from 4 to 12 inches in thickness, which is exceedingly rich. Gold can be seen without the aid of a glass, and the assay will be several hundred dollars to the ton. The main ledge is from 18 to 42 inches thick, and has a pitch of less than 45 degrees. He has tested some of this ore, and the yield has been $80 to the ton. Mr. Crandall is an old miner, and during his three summers' work in this mine, has thoroughly demonstrated the richness of the quartz and its quantity. A company, consisting of Messrs. D. W. Crandall, R. W. Crandall and H. Glenn, has been formed, and next spring, as soon as the weather will permit to take the machinery in, they will erect a mill on the ground, with a crushing power of eight tons daily. The ledge is situated about thirty-five miles from Union and forty miles from Baker City, and there is an excellent wagon-road within three miles. This is not the only vein in that vicinity, and Mr. Crandall expects in a few years that Union and Baker counties will reap quite a revenue from her mines.

UTAH.

THE CARBONATE.—Southern Utah *Times*, Dec. 3: That Rattler mine, belonging to the Carbonate or Frisco Mining Co., is beginning to make a record for itself here at home. It is right at home that the characteristics of a mine, its ores and its prospects are best understood. And, after a hurried visit to that camp yesterday, and examining the ore now being hauled to the railroad, a distance of two miles, we believe that under L. D. Davis' management, that property is only second just now to the Horn Silver. They are sinking now for quantities; they have had the quality for some time, and it is gratifying to note that the present ore body, while more than holding its former high grade, is increasing in width as depth is attained. The concentrator at the works is doing good work.

AN OPPORTUNITY FOR CHLORIDERS.—The history of the northern camps in this Territory should be an inducement to those owning mines in this vicinity to be guided by what it undoubtedly teaches. The mines of Bingham, Dry canyon, Ophir and the Cottonwoods, are now chiefly worked by leasers, and they are to-day the very life of each camp above mentioned. The hard working chlorider will do more with a doubtful piece of property than the absolute owner can possibly do by hiring miners at days' pay. This has been demonstrated beyond question. The reasons are obvious. The leaser works to make all he can out of a given piece of ground within a given time. He is generally a practical all around miner; sharpens his own tools, frames his own timbers, sorts his own ore and sees it to market.

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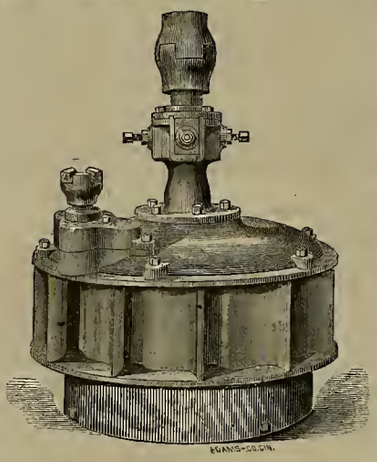

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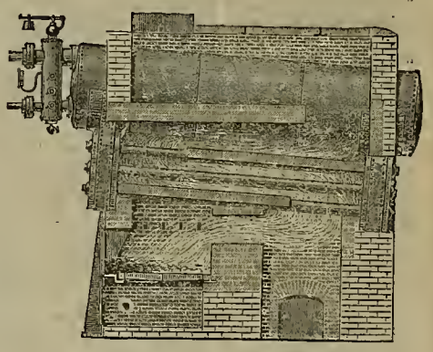

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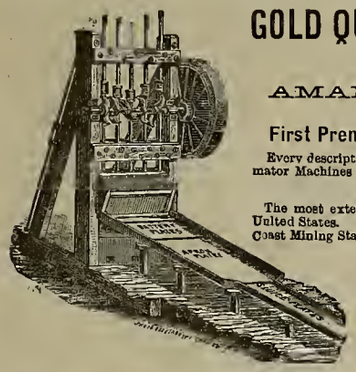

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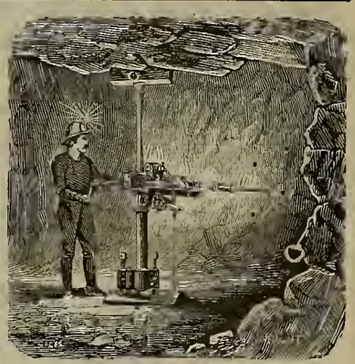

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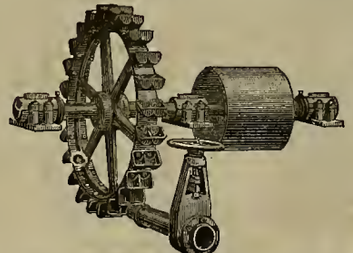

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The New River Mines.

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"The Hard Tack is stoping from the 62-foot level on a 20-inch ledge. The rock taken out is estimated at $200 per ton. Baker, Clement and Clifford, three of our 'honanza' holders have gone to San Francisco." DEAN.

New River City, New River District, Dec. 1, 1884.

Mining Share Market.

The shutting down of work, in the lower levels of the north end mines on the Comstock, and the shutting down on account of water, of the Alta and Benton mines seems to have upset the stock market, and dealers hardly know in what direction to move. The stoppage of pumps and use of water to the 2700 level of the C. and C. shaft, cannot flood the deeper levels of the meddel mines, as there are no openings through which it can pass. There is a good deal of virgin ground above. In the Mexican mine alone, from the 1300 level upwards, it is all virgin ground. On the 2000 level no cross-cuts have been run. On the 2300 level only two or three cross-cuts have been run. The 2500 level is practically unexplored. Neither has the 2700 level been thoroughly prospected. At the middle mines they are preparing to begin operations from the 3000 level up. The new hydraulic pumps will soon be at work. At the Alpha they have found a great body of quartz on the 900 level, and in this have found spots that go as high as $60 a ton. The outlook there at present is very encouraging. At Gold Hill the usual amount of ore is being taken out and milled by the leading companies.

Bullion Shipments.

Monitor, Nov. 29, $8,263; Navajo (for November), $56,792; Contention, 29, $10,448; Christy, 30, $10,211; Grand Prize mill (for November), $40,200; King, Dec. 6, $12,519; Hanauer, 2, $6,700; Crescent, 2, $850; Nevada ore, 2, $3,500; Horn Silver, 2, $18,000; Minnie Moore, 2, $4,588; Vienna, 2, $1,573; Mayflower, 3, $1,600; Crescent, 3, $1,900; Hanauer, 3, $2,450; Horn Silver, 3, $12,000; Minnie Moore, 3, $3,087; Ontario, 3, $20,271; Hanauer, 4, $4,500; Crescent, 4, $1,950; Horn Silver, 4, $9,000; Vienna, 4, $1,800; Horn Silver, 5, $9,000; Hanauer, 5, $2,400; Queen of the Hills, 5, $1,450; Hanauer, 7, $2,450; Queen of the Hills, 7, $1,300; Horn Silver, 7, $7,500; Minnie Moore, 7, $1,302; Ontario, 7, $14,122; Bodie, 8, $8,032; Standard, 1, $10,053; Navajo, 8, $14,000. The banks of Salt Lake City report the receipt for the week ending December 3, 1884, inclusive, of $146,947.41 in bullion, and $23,975 in ore; a total of $170,922.41.

USEFUL HOLIDAY PRESENTS FOR YOUNG AND OLD may be found at Muller's Optical Depot, 135 Montgomery St., near Busb, opposite the Occidental Hotel, San Francisco, as follows: Elegant Mercurial Barometers for Offices, Halls, Libraries, Hotels, Vessels, etc. Pocket Altitude Barometers for Mining Engineers. A full line of elegant Thermometers, Mining Compasses, Microscopes for Boys, from $1.00 to $10.00—something more costly and suitable for a Doctor's Office, both useful and ornamental. Opera, Field and Marine Glasses, Drawing Sets, Fine Gold Pebble Spectacles and Eye Glasses expressly made for the Holidays. Great pains taken in selecting Spectacles or Eye Glasses to be sent away for Christmas.

C. MULLER, Leading Optician, 135 Montgomery St., near Bush, opp. Occidental. x

At the World's Fair.

Back numbers and the latest files of this paper will be found in the California Department, and also in the Newspaper Exchange Department, of the World's Fair, New Orleans. Mr. W. H. Jessup, of the horticultural section of the California Department, can be consulted on business terms for this office, extra copies, etc.

NEW RIVER MINES.—In the article on the New River mines, published in the PRESS last week, "per cent" was used several times when "dollars" was intended. For instance, in speaking of assays "as high as 54 per cent," it should have read "$54 per ton." This correction will make the article read much more clear to miners.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCA	S.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M and M Co	Alaska		8	50	Dec 10	Jan 11	Jan 31	T J Hay	306 Pine st
Alta S M Co	Nevada		31	25	Dec 24	Jan 9	Jan 26	W H Whatsou	302 Montgomery st
Butte Creek Hyd M Co	California		10	10	Sept 23	Nov 6	Nov 29	R L Taylor	230 Montgomery st
Best & Belcher M Co	Nevada		31	50	Nov 21	Dec 30	Jan 19	W Willis	309 Montgomery st
Champion M Co	California		17	10	Nov 24	Dec 29	Jan 19	T Wetzel	522 Montgomery st
Con Amador M Co	California		8	30	Dec 3	Jan 5	Jan 21	F B Latham	408 California st
Copper Mt Con M Co	California		1	05	Dec 3	Jan 13	Feb 10	A L Perkins	310 Pine st
Chollar M Co	Nevada		15	50	Oct 29	Dec 2	Dec 23	C L McCoy	309 Montgomery st
Con Va & California M Co	Nevada		1		Nov 5	Dec 13	Jan 3	A W Havens	309 Montgomery st
Crocker M Co	Arizona		1		Oct 31	Dec 2	Dec 23	A Waterman	309 Montgomery st
Gould & Curry S M Co	Nevada		49	50	Oct 25	Nov 29	Dec 22	A K Durbrow	309 Montgomery st
Grand Prize M Co	Nevada		17	30	Nov 24	Dec 30	Jan 26	E M Hall	327 Pine st
Hale & Norcross S M Co	Nevada		83	50	Dec 8	Jan 13	Feb 3	J F Lightner	309 Montgomery st
Indian Spring Drift M Co	California		4	05	Nov 21	Dec 22	Jan 21	A B Paul	328 Montgomery st
Lewis Con M Co	Arizona		5	03	Nov 14	Dec 22	Jan 19	J W Pew	310 Pine st
Mayflower Gravel M Co	California		27	10	Nov 20	Dec 23	Jan 12	J Morbzio	328 Montgomery st
Marshall M Co	California		2	10	Nov 6	Dec 15	Jan 5	A L Perkins	310 Pine st
Mexican G M Co	Nevada		28	50	Nov 11	Dec 17	Jan 8	C E Elliott	309 Montgomery st
Ophir M Co	Nevada		48	50	Nov 12	Dec 17	Jan 6	E B Holmes	309 Montgomery st
Rainbow M Co	California		12	15	Oct 24	Dec 1	Dec 29	P F Marbardt	311 Montgomery st
Standard M Co	California		1	25	Oct 17	Dec 1	Jan 5	W Willis	309 Montgomery st
Sierra Nevada S M Co	Nevada		80	50	Oct 22	Nov 26	Dec 25	E L Parker	309 Montgomery st
Savage M Co	Nevada		61	50	Nov 11	Dec 15	Jan 5	E B Holmes	309 Montgomery st
Utah S M Co	Nevada		51	50	Oct 23	Nov 23	Dec 16	G C Pratt	309 Montgomery st
Union Con M Co	Nevada		28	50	Nov 5	Dec 9	Dec 30	J M Buttington	309 California st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Gould & Curry M Co	Nevada	A K Durbrow	309 Montgomery st	Annual	Dec 15
Combination M Co	Arizona	A Waterman	309 Montgomery st	Annual	Dec 22
Gould & Curry M Co	Nevada	A K Durbrow	309 Montgomery st	Annual	Dec 22
Head Center & Tranquility M Co	Arizona	J W Pew	310 Pine st	Annual	Dec 23
Jupiter Blue Gravel M Co	California	E Lan'e	309 Montgomery st	Annual	Dec 24
Mt Diablo M Co	Nevada	R W Heatt	318 Pine st	Annual	Dec 12
Ophir M Co	Nevada	E B Holmes	309 Montgomery st	Annual	Dec 11
Peer M Co	Arizona	A Waterman	309 Montgomery st	Annual	Dec 22
Peerless M Co	Arizona	A Waterman	309 Montgomery st	Annual	Dec 22
Weldron M Co	Arizona	A Waterman	309 Montgomery st	Annual	Dec 26

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	B L Burling	326 Montgomery st	50	Dec 5
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Dec 15
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Oct 6
Navajo Con	Nevada	J W Pew	310 Pine st	25	Dec 15
Paradise Valley M Co	Nevada	W Letts Oliver	323 Montgomery st	10	Nov 28
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Dec 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Nov 6

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication in this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.

DATE. Dec 4-Dec10	Portland. Rain	Temp	Wind	Weather	Red Bluff. Rain	Temp	Wind	Weather	Sacramento. Rain	Temp	Wind	Weather	S. Francisco. Rain	Temp	Wind	Weather	Los Angeles Rain	Temp	Wind	Weather	San Diego. Rain	Temp	Wind	Weather
Thursday	.00	46	S	Cy.	.00	58	E	Cl.	.00	56	E	Cl.	.00	66	NE	Cl.	.00	66	C	Cl.	.00	64	NW	Cl.
Friday	.17	45	W	Cy.	.00	60	N	Cl.	.00	51	NW	Cl.	.00	55	NE	Cl.	.00	72	SW	Cl.	.00	68	W	Cl.
Saturday	.—	40	NW	Fr.	.00	52	NW	Cl.	.00	54	NW	Cl.	.00	55	N	C.	.00	65	SE	Cl.	.00	61	W	Fr.
Sunday	.00	34	N	Cy.	.00	47	N	Cl.	.60	53	N	Cl.	.00	49	N	Cl.	.00	49	W	Fr.	.00	58	W	Cy.
Monday	.07	42	E	Cl.	.00	53	N	Cl.	.00	51	NW	Cy	.00	55	N	Cy.	.37	51	SE	Cy	1.05	50	SE	Cy.
Tuesday	.02	42	NW	Cl.	.00	62	N	Cl.	.00	47	SE	Cl.	.00	52	SE	Cl.	.—	58	S	Fr.	.68	57	W	Cy.
Wednesday	.39	38	N	Cl.	.00	59	N	Fr.	.00	48	SE	Cl.	.00	54	SE	Cl.	.00	59	C	Cl.	.00	58	S	Cl.
Totals	.17				.00				.00				.00				.37				1.73			

EXPLANATION.—Cl. for clear; Cy., cloudy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature wind and weather at 11:58 A. M. (San Francisco mean time), with amount of rainfall in the preceding 24 hours

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Nov. 20.		WEEK ENDING Nov. 27.		WEEK ENDING Dec. 4.		WEEK ENDING Dec. 11.	
Alpha	.65	.90	.75	.80	.75	.95	.75	.80
Alta	.55	.75	.30	.55	.25	.35	.20	.30
Andes	....	.25	.20	.35	....	.25	....	.20
Argenta	....	....	....	.10	....	....	....	....
Belcher	.45	.65	....	.55	.65	....	....	.55
Belding	....	....	....	....	....	....	....	....
Best & Belcher	1.00	1.30	1.00	1.10	1.00	1.25	.80	1.15
Bullion	.15	.75	....	....	.15	.25	.20	.30
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	.26	.30	....	....	.30	....	....	.25
Bodie Con	2.90	3.20	2.55	3.15	2.40	2.80	2.10	2.70
Benton	.15	.20	.10	.15	....	.10	....	.03
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	.40	.50	....	.40	....	.30	.30	.50
California	....	....	....	.10	.10	.15	.05	.35
Challenge	....	....	....	....	....	.15	....	....
Champion	....	....	....	....	....	....	....	....
Chollar	1.35	1.75	1.70	1.90	1.70	2.90	2.40	2.75
Confidence	.50	.65	....	....	.60	.70	....	.65
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	.10	.15	....	.10	.10	.15	.05	.05
Con. Pacific	.90	.95	.90	.95	....	.95	.90	.95
Crown Point	.55	.80	.75	.80	.75	.90	.65	.75
Day	....	.75	....	.75	....	....	....	.75
Eureka Con	....	....	....	2.90	....	2.75	2.40	2.50
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	.20	1.00	.13	.15	.15	.20	.10	.15
Grand Prize	....	....	....	.10	.05	.10	....	.10
Gould & Curry	.55	.75	.50	1.05	1.00	1.30	1.00	1.25
Goodshaw	....	....	....	....	....	....	.05	.10
Hale & Norcross	2.25	2.85	2.50	2.95	2.90	3.25	2.50	3.00
Holmes	3.50	3.75	....	3.70	....	....	3.75	4.05
Independence	....	....	....	....	....	....	....	.15
Julia	....	....	....	....	....	....	....	....
Justice	....	.10	....	.15	....	.15	....	.10
Martin White	....	....	....	....	....	....	....	....
Mono	1.30	1.50	.65	1.35	.65	1.00	1.00	2.20
Mexican	.55	.70	.45	.60	.45	.65	.20	.45
Mt. Diablo	....	3.50	....	....	3.75	3.90	3.80	3.95
Northern Belle	....	....	....	....	....	....	....	....
Navajo	3.00	3.55	3.20	3.25	2.75	3.25	2.70	3.00
North Belle Isle	....	.40	.35	.40	.30	.40	.20	.25
Occidental	1.00	1.15	....	1.25	....	1.10	....	1.00
Ophir	.50	.60	.50	.65	.50	.60	.20	.50
Overman	....	.10	....	....	....	.10	....	.10
Potosi	.65	.95	.75	.90	.80	1.16	.85	1.10
Final Con	....	....	....	....	....	....	....	....
Savage	.65	.90	.76	.85	.75	1.10	.70	1.00
Seg. Belcher	....	.60	....	....	....	....	....	....
Sierra Nevada	.45	.65	.45	.90	1.00	1.20	.70	1.10
Silver Hill	....	....	....	....	....	....	....	....
Silver King	4.75	5.00	....	5.25	....	....	5.50	5.75
Scorpion	....	.10	....	.10	....	.15	.05	.10
Syndicate	....	.45	....	....	....	.45	.40	.45
Tioga	....	....	....	....	....	....	....	....
Union Con	.45	.65	.45	.50	.45	.60	.30	.80
Utah	.30	.40	....	.30	.70	.85	.60	.80
Yellow Jacket	.90	1.50	1.15	1.20	1.05	1.15	.70	1.10

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

Sales at San Francisco Stock Exchange.

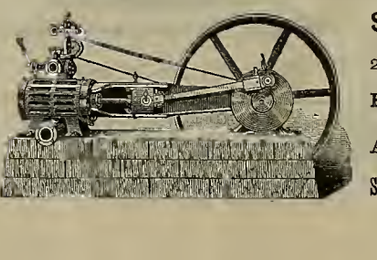
THURSDAY A. M., Dec. 11.

500 Bodie Con	2.05	240 Alta	20c
200 Belle Isle	20c	100 Alpha	70c
100 Bulwer	30c	850 Bodie	2.05@2.10
150 Benton	05c	230 B. & Belcher	80@85c
100 Bullion	20c	550 Bulwer	30c
100 Con. Va & Cal	30c	300 Chollar	2.40@2.45
100 Con. Pacific	1.00	50 Crown Point	60c
50 Confidence	50c	100 Eureka Con	2.40
100 Crown Point	65c	100 Exchequer	10c
100 Exchequer	15c	250 Gould & Curry	1.10
250 Gould & Curry	1.05	200 Hale & Nor	2.55
320 Hale & Nor	2.60	50 Holmes	4.00
200 Justice	10c	800 Justice	10c
1050 Mexican	20@23c	1300 Mono	1.30
700 Mono	1.20	850 Mexican	20@23c
100 Navajo	2.40	80 Mt. Diablo	4.00
300 Opbir	15c	150 Navajo	2.50
195 Occidental	75@80c	500 Ophir	2@25c
200 Potosi	80c	130 Potosi	80@85c
200 Sierra Nevada	75c	300 Solid Silver	10c
350 Savage	65c	250 Scorpion	03c
375 Solid silver	25c	150 Sierra Nevada	70@75c
630 Union	65c	600 Savage	70c
		150 Union Con	65c
		120 Yellow Jacket	70c

AFTERNOON SESSION.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.



Market Reports.

Lumber at Wholesale.

The prices of lumber are fixed by the Association, but there is now so much "cutting under" that it is difficult to state any fixed price. Since the break in the Association which occurred recently, the prices have been much lowered from the figures given, which are, however, those agreed upon. Quotations of cargo rates are as follows for redwood lumber, for delivery at San Francisco, Oakland, Alameda, Berkeley, Vallejo, Benicia, Port Costa, Martinez and Antioch:

ROUGH—No. 1 rough merchantable, $13; No. 2 (refuse) rough, $14; No. 1 rough boards (specified width, 10 inches and over); $19; No. 2 (refuse) do do do, $14; No. 1 rough lumber, surface one side, $21; No. 2 (refuse) do do do $18.

PICKETS—Rough square pickets, $12; rough pointed do, $14; fancy pointed do, $22.

HALF-INCH LUMBER—No. 1 ½-inch surfaced, board measure, $40; No. 2 do do do, $39; No. 3 do do do, $38; No. 4 (refuse) do do do, $32; No. 1 ½-inch battens, board measure, $40; No. 2 (refuse) do do do, $32; No. 1 ½-inch siding, 12 ft. and over, b m, $40; No. 2 (refuse) do do do $32; ½-inch siding, under 12 ft, $32.

RUSTIC—No. 1 Rustic, 1x10, 12 ft and over, $33; No. 2 do do do, $32; No. 3 do do do, $31; No. 4 Rustic, 1x10, $28; No. 5 (refuse) do do do, $21; No. 1 Rustic, 1x8, 12 ft and over, $31; No. 2 do do do, $30; No. 3 do do do, $29; No. 4 Rustic, 1x8, $26; No. 5 (refuse) do do, $21.

CLEAR—No. 1 surfaced and rough clear, $32; No. 2 do do do, $31; No. 3 do do do, $30; No. 4 (refuse) do do do, $24; No. 1 surfaced and rough clear, 1x8 and 1x6, $30; No. 2, do do do, $29; No. 3 do do do, $28; No. 4 (refuse) do do do, $24.

[Dimensioned, Surfaced and Rough Clear (widths and lengths), 12 inches wide and over, add $1 ₱ M (on each corresponding grade) to the above list prices of "Clear."]

TONGUED AND GROOVED—No. 1 T and G, 1x4, 12 feet and over, $33; No. 2 (refuse) do do do, $24; No. 1 T and O, 1x6, 12 ft and over, $30; No. 2 (refuse) do do do, $24; T and G, 1x6, 7 to 11 ft, $29; do do, under 7 ft, $23.

TONGUED, GROOVED AND BEADED—No. 1 T, G and Beaded, 1x4, 1¼x4 and 1¼x6, 12 ft and over, $32; No. 2 (refuse) do do do, $24; T, G and Beaded, 1x4, 1¼x4 and ¼x6, 7 to 11 ft, $27; do do, under 7 ft, $22.

ROUGH CLEAR—1x6 and under in width, and under 12 ft in length, $24.

[On a credit of 60 days, or a discount at the rate of 1 per cent per month for anticipated payments, and not less than 1 per cent per month added for extension of the same].

We quote cargo rates - Pine—Merchantable Rough, $15 ₱ M; Flooring, $24.29; Stepping, $37 ₱ M; Redwood—Merchantable Rough, $13; Surfaced, $32; Rough Clear, $32; Rustic, $33; Tongued and Grooved, $30; Tongued, Grooved and Beaded, $32.

Lumber at Retail.

Retail quotations for pine, fir and spruce are as follows:

ROUGH MERCHANTABLE—(Ordinary sizes) to 40 feet long, per M ft, $22.50; Rough Merchantable, 1x6, Fencing, $22.50; do do, 1x4, do, $23.50; do do, 1x3, do, $24.50; do do, 1x4, odd lengths, $22.50; do do, 1x6, do $21.50; do No. 2, all sizes, $18.50; do Selected, $26.50; do Clear, other than for T and G and Stepping, $31.

[Rough Clear for T and G and Stepping $1 ₱ M less than price of kind for which intended.]

Dressed T and G Flooring, 1x6, No. 1, vertical grain, ₱ M ft, $38.50; Dressed T and G Flooring, 1x6, No. 1, $33.50; do do do, No. 2, $28.50; Dressed T and G Flooring, 1x3, 1x4, 1¼x4 and over, No. 1, vertical grain, $40.50; do do do, No. 1, $35.50; do do do, No. 2, $29.50; Dressed Stepping, No. 1, vertical grain, $42.50; do do, No. 1, $37.50; do do, No. 2, $28.50.

SPRUCE—Rough Merchantable, ₱ M ft, $21.50; do Clear, $35; Clear Dressed (shelving), $40; Pickets (rough) board measure, $20.50; Furring, 1x2, per lineal ft, 1c; Laths, 1 and 1½inch, ₱ M, $3.60; 1½-inch, $4.

[N. B.—For all sizes over 14 inches, and lengths over 40 feet, extra rates].

Retail quotations of Redwood are as follows:

ROUGH MERCHANTABLE—₱ M ft, $22.60; do Selected, $27.50; do No. 2, $18.50; Surface, No. 1 and Rough Clear, $40; do, 1x6, $37.50; do, No. 2, $30; Rustic, No. 1, 1x8, $37.50; do, No. 1, 1x10, $40; do, No. 2, $35; do, under 10ft, $35; T and G Redwood, 1x4, 1¼x4 and 1¼x6, $40; do do, 6-inch, 12 ft and over, $37.50; do do do, 7 to 11 ft, $32.50; do do do, under 7 ft, $30; do do do, No. 2, $30; do do, Beaded, 12 ft and over, $40; do do do, 7 to 11 ft, $32.50; do do do, under 7 ft, $30; Half inch Surface, $22.50; Pickets, Fancy, $30; do, Rough, pointed, $20; do do, square, $17.50; Siding, ½ inch, $27.50; Battens, ½ inch, per lineal ft, 1c; Shingles, ₱ M, $2.50; Shakes, Split, $14; do, Sawed, $12; Posts, per piece, 13c; Dressed Boards, ₱ M ft, $25.

On a credit of 60 days or less, or a discount of two (2) per cent for cash only. On all credits exceeding 60 days' time, not less than one (1) per cent per month to be added.

Under the rules of the Exchange, no "lump" sum will be given on any bill of lumber.

Nails.

The market is inactive and the prices appended might be shaded on large orders. We give the price list of the Pacific Iron and Nail Company.

FENCE AND BRAD.—10d to 60d, $2.75; 8d and 9d, $0.25; 6d and 7d, $0.50; 4d and 5d, $0.75; 3d, $1.50; 2d, $2.75. Fence, $0.25.

BARRELS.—2 inch, $0.00; ¾ inch, $3.00; 1 inch, $2.50; 1¼ inch, $1.75; 1¼ inch, $1.50; 1⅜ inch, $1.00; 1½ inch, $0.75.

LINING.—¾ inch, $4.50; ⅞ inch, $6.00.

TOBACCO.—10d, $0.50; 8d, $0.75; 6d to 7d, $1.00.

CLINCH.—6d to 30d, $1.75.

SLATING.—6d, $1.00; 4d, $1.00; 3d, $1.75; 2d, $3.00.

FINISHING.—2d, 1 inch, $6.00; 3d, 1¼ inch, $4.00; 4d, 1½ to 1¾ inch, $1.75; 5d, 2 inch, $1.50; 8d, 2½ inch, $1.25; 10d, 3 inch and over, $1.00.

CASING AND BOX.—10d to 30d, $0.75; 8d, $1.00; 6d, $1.25; 4d, $1 50; 3d, $2.50.

FINE BLUED.—4d, $1.75; 3d, $3.00; 2d, $3.75.

CUT SPIKES.—All sizes, $0.25.

BOAT SPIKES.—All sizes, $0.75.

Each half keg 10 cents extra.

TERMS.—Note or acceptance at 60 days with current rate of Exchange on S. F., or a discount of 2 per cent for cash, if remitted within 10 days from date of invoice.

All accounts when due subject to sight draft without notice.

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Lime, per barrel, $1.50@$1.00. Plaster, $2.75–3.00. Eastern Plaster, $3.00–3.25. Rosendale Cement, $2.25–2.75. Portland Cement, $3.50–3.75. Fire Brick, per 1,000, $40 @ $45, according to brand; hard, $10.00@$12,00; red, $8.00@$8.50; soft, $7.50; face, $30.00.

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List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.]

FOR WEEK ENDING DECEMBER 2, 1884.

308,651.—GRAIN SEPARATOR—Robert Brand, Oakland, Cal.

308,657.—AMALGAMATOR—Jas. M. Dyer, S. F.

308,660.—ROWLOCK—O. B. Fenner, Oakland, Cal.

308,763.—STILL.—J. M. Foy, S. F.

308,771.—RAIL FASTENING—John Howe, Newhall, Cal.

308,677.—STEAM BOILER—Wm. Kincaid, Oakland, Cal.

308,804.—SHIP'S STEERING APPARATUS—Chas. F. Rodeen, S. F.

308,714.—COMPOSITE FUEL—C. Van Gulpen, S. F.

308,723.—GOLD SAVING APPARATUS—Wilson & Gifford, Candelaria, Nev.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

THRASHING TEETH.—John Christian, San Jose. No. 308,136. Dated Nov. 18, 1884. This invention relates to certain improvements in the construction of teeth used in the cylinders of thrashing engines; and it consists in a novel formation of the teeth, to strengthen them in the direction of greatest strain, and to present the thickest portion in the direction toward which the teeth are moving.

BLANK FOR FORMING THRASHING MACHINE TEETH.—John Christian, San Jose. No. 308,135. Dated Nov. 18, 1884. This consists mainly in the formation of the blanks for the steel prongs, which are to be welded to iron teeth to increase their durability, and in a means for retaining the rough blanks from which the tooth and front are formed, in contact, until they are welded securely by a drop-hammer and dies.

FIRE KINDLER.—Constant Leduc, S. F., No. 308,178. Dated Nov. 18, 1884. This fire kindler consists of a bunch made of the stems or stalks of the tule grass, with or without a core of wood, said bunch being coated with, and its interstices permeated by some inflammable substance, such as rosin. The object of the invention is to provide a light package or bunch of a highly inflammable material or substance.

WINDMILL.—Chas. S. Sellers, Brentwood, Contra Costa county, Cal. No. 308,205. Dated Nov. 18, 1884. This invention relates to that class of windmills in which the length of the stroke of the pitman is governed by the varying force of the wind acting upon a graduated crank, and which are thrown out of the wind by an upright vane acting on a turn-table. The invention consists in a novel means for reodering effective the graduated crank, in the means by which it is connected by the pitman, and in the means by which the upright vane is connected with the turn-tables.

VINE PLANTER.—Joseph D. Enas, Napa. No. 307,532. Dated Nov. 4, 1884. This implement for vine planting consists of an elongated, narrow, tapering blade, bent to form an angle on a central longitudinal line, whereby it is given an angularly-concaved face and an angularly-convexed back. The upper end of the blade is secured to foot-rest strips, the end of which projects beyond the sides of the blade, and a suitable handle is riveted to the blade after the manner of ordinary spades or shovels. The object of the invention is to provide an implement which can be readily thrust into the ground and by a reciprocating movement of its handle will displace the earth sufficiently to permit the insertion of the vine, and which, while still in the earth, serves by reason of its central angle, to afford an accurate guide for the proper location of the vine.

FRUIT PICKER.—Henry W. Folsom, S. F., No. 308,148. Dated Nov. 18, 1884. This picker is of that class in which a knife or blade cuts shear-wise across a V shaped knife; and it consists in a novel arrangement of knife and guide, whereby the stems of the fruit are easily reached without interference, and in a peculiar connection between the said knife and guide, whereby an effective cut is made which combines with a shear-like action and a draw cut. The fruit pickers of this class have their guide by which they find the stems of the fruit, but at so great an angle with the handle by which it is held that it is difficult to operate it from a convenient position; and, farther, the parts are so constructed that, generally, the blade of the knife projects so far from the guide as to be in the way and render it inconvenient to find the stems. This is a disadvantage in all kinds of work of this nature; but is more conspicuous when used for picking oranges or other fruit which grows in clusters. The object of Mr. Folsom's invention is to provide a fruit picker, the parts of which shall not be in the way of the perfect operation of the device, and which in its operation shall make a clean and sure cut.

A Plain Book on Assaying.

"ASSAYING GOLD AND SILVER ORES"—By C. H. Aaron—Is a new work published by Dewey & Co., which is intended by its author to be available for the use of miners, prospectors and others who only care to know how to assay gold and silver ores.

The author of this work is well known in the mining regions of the Pacific coast as a practical metallurgist of many years experience. His writings for the press and his two previous works ("Testing and Working Silver Ores," and "Leaching Gold and Silver Ores") have shown his ability as a writer. The little book is plainly and simply written, more especially for the use of those persons not familiar with chemistry. No symbols are used, everything being plainly stated and clearly described. The scope of the book is shown in its table of contents as follows: Introduction; Implements; Assay Balance; Materials; The Assay Office; Preparation of the Ore; Weighing the Charge; Mixing and Charging; Assay Litharge; Systems of the Crucible Assay; Preliminary Assay; Dressing the Crucible Assays; Examples of Dressing; The Melting in Crucibles; Scorification; Cupellation; Weighing the Bead; Parting; Calculating the Assay; Assay of Ore Containing Coarse Metal; Assay of Roasted Ore for Solubility; To Assay a Cupel; Assay by Amalgamation; To Find the Value of a Specimen; Tests for Ores; A Few Special Minerals; Solubility of Metals; Substitutes and Expedients; Assay Tables. These assaying tables give simple directions for figuring out results. This is the simplest, cheapest and most easily comprehended work on assaying yet published. The volume comprises 106 pages, with illustrations, and is well bound in cloth. The price is $1, postpaid. Published by Dewey & Co., MINING AND SCIENTIFIC PRESS office, San Francisco—1884.

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Dec. 11, 1884.

ANTIMONY—Per pound		@	—
Hallett's	12½	@	—
Cookson's	13	@	—
BORAX—Refined	7	@	8
IRON—Glengarnock ton	25 00	@	—
Eglinton, ton	24 00	@	—
American Soft, ton	25 50	@	—
Oregon Pig, ton		@	—
Clipper Gap, Nos. 1 to 4		@	—
Clay Lane White	22 00	@	—
Shotts, No. 1	26 00	@	—
Refined Bar	3	@	5½
Boiler, 1 to 4	5 00	@	5 50
Plate, 5 to 10	4½	@	4¾
Nail Rod	7	@	—
Norway, according to thickness	6	@	7
STEEL—English, B.	15	@	25
Black Diamond, ordinary sizes	13	@	—
Drill	15	@	—
Machinery	12	@	14
COPPER—Ingot	14	@	15
Braziers' sizes	—	@	15
Fire-box sheets	28	@	—
Bolt	23	@	25
Yellow Metal	16	@	17
LEAD—Pig	3½	@	—
Bar	6	@	—
Pipe	7	@	—
Sheet	8	@	—
Shot, discount 10% on 500 bags: Drop, ₱ bag	1 85	@	—
Buck, ₱ bag	2 05	@	—
Chilled, do	2 25	@	—
TINPLATE—Oldcastle	5 25	@	6 00
Charcoal	5 75	@	6 75
Coke	5 25	@	6 50
Roofing	6 25	@	13 00
ZINC—German	9	@	10
Sheet, 7 to 10 ₱. less the cask	9	@	10
QUICKSILVER—By the flask	35 00	@	—
Flasks, new	1 05	@	—
Flasks, old	85	@	—
NEW YORK PRICES—			
California Borax, refined	8½	@	8¾
Pig Iron, American No. 1	19 50	@	20 00
Pig Iron, American No. 2	18 00	@	19 00
Quicksilver	48	@	50
Copper	12½	@	—
Bar Silver	1 07½	@	—

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Lost Papers.

If any subscriber fails to receive this paper promptly, after making due inquiries at the Postoffice, he is urgently requested to notify this office by *letter*, that we may send the missing papers, and, if possible, guard against further irregularities.

S. F. VISITOR'S DIRECTORY.

For the convenient reference of our readers, and benefit of visitors to S. F. from the interior and abroad, we shall occasionally insert the following directory free. Officers of associations mentioned are invited to notify us promptly of any changes occurring from time to time.

California Academy of Sciences.

Hall and museum, S. W. corner California and Dupont. President, PROF. GEORGE DAVIDSON; Secretary, CHARLES G. YALE. Regular meetings, 1st and 3d Mondays of each month. Museum open to the public from 9 A. M. to 5 P. M. on Mondays, Wednesdays and Saturdays. Museum embraces all classes of natural history specimens.

Crocker-Stanford Collection.

This collection was presented to the California Academy of Sciences by Charles Crocker and Leland Stanford. It comprises a large number of specimens of minerals, casts and articles in all branches of natural history. Among other things are many of Ward's casts, including the monster elephants, mammals, etc. The collection is on exhibition at Mercantile Library Hall, 214 Bush St., and is open to the public every Saturday from 10 A. M. to 9 P. M. Chas. D. Gibbes, curator.

California Pharmaceutical Society.

Lectures are given at the hall of the College of Pharmacy Fulton street, between Polk and Van Ness avenue, three nights each week, for a term of six months, in the summer.

California State Geological Society.

Henry G. Hanks, President; S. Heydenfeldt, Jr., Secretary. Headquarters, State Mining Bureau, 212 Sutter St.

Geographical Society of the Pacific.

Rooms, 413 Sutter St. President, George Davidson; Secretary, C. Mitchell Grant. Meetings, 1st and 3d Tuesdays of each month.

California State Mining Bureau.

Office and museum, 212 Sutter St. State Mineralogist, Henry G. Hanks. Open daily to visitors free, from 10 A. M. to 3 P. M. Museum comprises ores, minerals, rocks and natural products of the State.

Mechanics' Institute.

Rooms and library, 31 Post St. P. B. Cornwall, President; W. P. Stout, Recording Secretary; Horace Wilson, Librarian.

Peoples' Free Library.

Location, north side of Bush, between Kearny and Dupont. Librarian, Fred B. Perkins. Open from 9 A. M. to 9 P. M.

Mercantile Library Association.

Library, 214-218 Bush. A. E. Whitaker, Librarian. There are 52,000 volumes in the library. Reading room, with papers and magazines.

Technical Society of the Pacific Coast.

Hall, 413 St. President, Col. Geo. H. Mendell, U. S. A.; Secretary, Charles G. Yale. Regular meeting, first Friday of each month; extra meeting for discussion of papers, last Friday of each month.

Society of California Pioneers.

Rooms, 808 Montgomery St. President, Nathaniel Holland; Secretary, F. Vassault. There is a library cabinet of minerals, relics of early times, and other objects of interest at the rooms. Regular meetings, first Monday of each month.

San Francisco Microscopical Society.

Rooms, 120 Sutter St. President, C. Mason Kinne; Secretary, E. J. Wickson. Meetings, second and fourth Wednesdays of each month.

University of California.

Location, Berkeley. Museum comprises the collection of the State Geographical Survey, the Hoche and Keene collections, and a large miscellaneous collection of the woods, ores, minerals, rocks, etc., of the Pacific Coast.

Golden Gate Park.

The Park may be reached directly by cable cars of the Haight St. or McAllister St. line, which run out Market and branch off at the streets named, for the Park, or by the Geary St. line. The Park is opened for visitors at all times.

Woodward's Gardens.

Mission St., between 13th and 14th. Reached by Folsom, Mission, Howard and Market St. cars. In the gardens are menagerie, museum, art gallery, aviary, aquarium, theatre, restaurant etc.

Cheap Ore Pulverizer.

There is for sale in this city, by I. A. Heald, American Machine and Model Works, 111 and 113 First street, a Rutherford Pulverizer, an improved revolving barrel crusher, which was only used a few times and is as good as new. It will be sold very much below costs, and miners who are in need of such an appliance for a small mine will do well to make inquiries concerning it. It is suitable for a pulverizing mill for powder or other substances. References as to above can be had upon applying to this office.

DIVIDEND NOTICE.

OFFICE OF THE

Silver King Mining Company,

San Francisco, December 2, 1884.

At a meeting of the Board of Directors of the above-named Company, held this day, Dividend No. 45, of Twenty-five cents (25c.) per share, was declared, payable on MONDAY, December 15, 1884. Transfer books will close December 8, 1884, at 12 M.

JOSEPH NASH, Sec'y.

OFFICE—Room 19, Safe Deposit Building, 328 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Bodie Consolidated Mining Co.,

Room 62, Nevada Block, San Francisco, Nov 20, 1884.

At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 18) of Fifty Cents per share was declared on the capital stock of the Company, payable Friday, December 5, 1884, at the office of Messrs. Laidlaw & Co., New York, only on stock issued from the Transfer Agency in that city, and at the San Francisco office only on stock issued here. Transfer books will close on Saturday, November 29, 1884, at 12 o'clock M.

B. L. BURLING, Ass't Sec'y.

Dewey & Co.'s Scientific Press Patent Agency.

OUR U. S. AND FOREIGN PATENT AGENCY presents many and important advantages as a Home Agency over all others, by reason of long establishment, great experience, thorough system, intimate acquaintance with the subjects of inventions in our own community, and our most extensive law and reference library, containing official American and foreign reports, files of scientific and mechanical publications, etc. All worthy inventions patented through our Agency will have the benefit of an illustration or a description in the MINING AND SCIENTIFIC PRESS. We transact every branch of Patent business, and obtain Patents in all countries which grant protection to inventors. The large majority of U. S. and Foreign Patents issued to inventors on the Pacific Coast have been obtained through our Agency. We can give the best and most *reliable* advice as to the patentability of new inventions. Our prices are as low as any first-class agencies in the Eastern States, while our advantages for Pacific Coast inventors are far superior. Advice and Circulars free.

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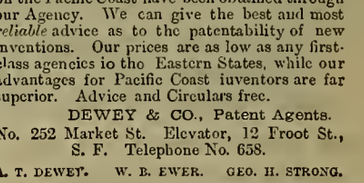

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ASSESSMENT NOTICE.

The Eureka Gas Company.—Location of principal place of business, San Francisco, Cal. Location of works, Eureka, Humboldt county, Cal.

NOTICE is hereby given that at a meeting of the Board of Directors, held on Wednesday the third day of December, 1884, an assessment (No. 1) of one dollar per share was levied on the capital stock of the corporation, payable immediately in United States gold coin to the Secretary at the office of the company, 302 Pine St., San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on Wednesday the fourteenth day of January, 1885, will be delinquent, and advertised for sale at public auction, and unless payment be made before, will be sold on Monday the second day of February, 1885, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

C. S. BACHELDER, Sec'y.

OFFICE—302 Pine St., San Francisco, Cal.

ASSESSMENT NOTICE.

Gould and Curry Silver Mining Company.

ASSESSMENT No. 49.

Levied	October 25, 1884
Delinquent	November 29, 1884
Day of Sale	December 22, 1884
Amount	Fifty cents per share.

ALFRED K. DURBROW, Secretary.

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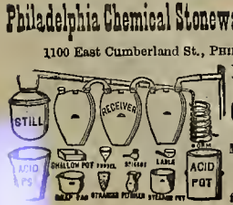

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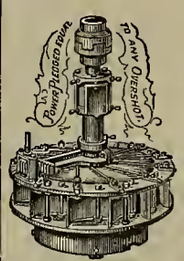

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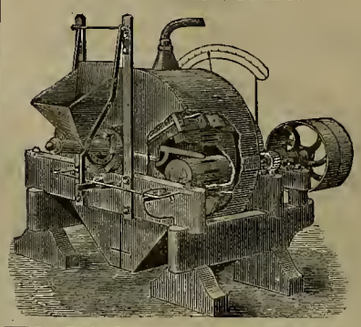
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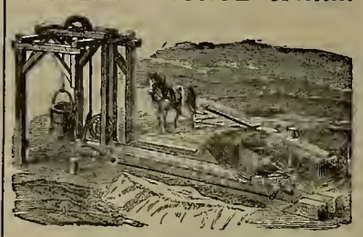
MINERS' HORSE WHIM.

ONE HORSE CAN EASILY HOIST OVER 1,000 LBS. at a depth of 500 feet. The Whim is mainly built of wrought iron. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending the bucket. The standard of the whim is bolted to bed-timbers, thus avoiding all frame-work. When required, these whims are made in sections to pack on mules.
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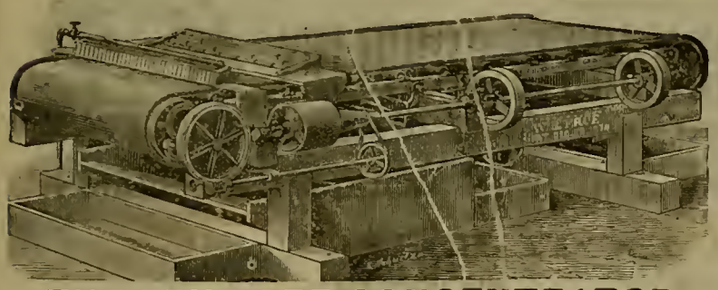

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The Frue Vanning Machine Company warn the public that they claim and will prove the Triumph machine to be an infringement on patents owned by them.

Protected by patents May 4, 1869, Dec. 22, 1874, Sept. 2, 1879, April 27, 1880, March 22, 1881, Feb. 20, 1883, Sept. 18, 1883. Patents applied for.

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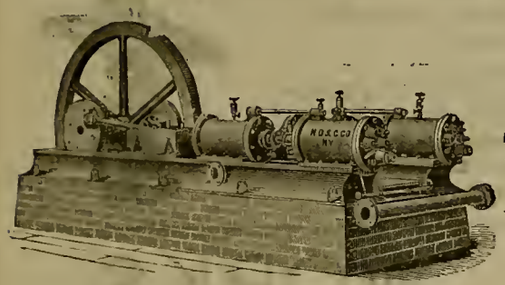

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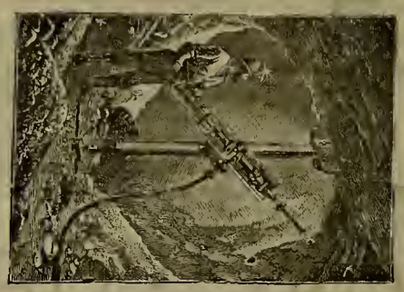

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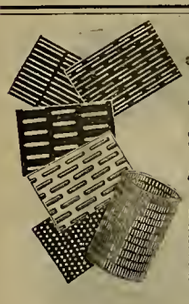

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In Valves having ground or metal seats, should sand or grit get upon the seat it is impossible to make them tight except by regrinding, which is expensive if done by hand, and if done by machine soon wears out the valve, and in most cases they have to be dis connected from the pipes, often costing more than a new valve. The JENKINS Disc used in these Valves is manufactured under our 1880 Patent, and will stand 200 lbs. steam. Sample orders solicited. To avoid imposition, see that Valves are stamped "Jenkins Bros." For sale by

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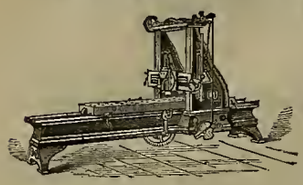

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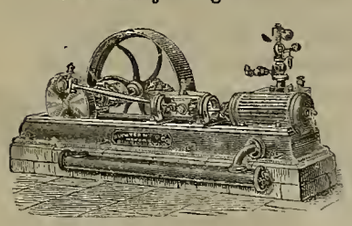

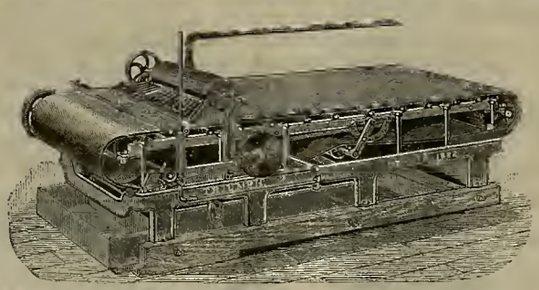

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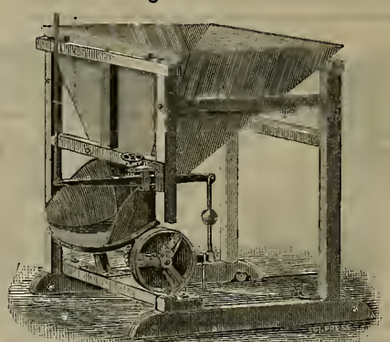

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, DECEMBER 20, 1884.

VOLUME XLIX. Number 25.

Academy of Sciences.

Prof. Davidson presided at the regular meeting of the California Academy of sciences, which was held on Monday evening last. Mr. J. H. Smythe was proposed for membership. Among the donations to the museum, was a very curious crab of rare species, four birds, and reptiles and insects from the New Hebrides Islands. Mr. S. H. Rankin presented a centipede, found in a bunch of bananas, brought from Mexico. From H. M. Hollister, hat, from Auburn, Placer county. From George Davidson, fossil shells from San Pedro, and fragments of fossil bones from San Luis, Obispo county. C. D. Gibbes, two star-fish. W. Zimmerman, lizard from Mexico. Ward McAllister, piece of wood perforated by a species of torpedo, Sitka, Alaska.

The President called attention to the fact, that the glass tubes which he had exhibited at the previous meeting as having been fractured after a metal wire had been passed through them, had broken in many other places since they were left on the table.

Professor Davidson presented some observations on astronomical errors, due to local deflection of the plumb line. He pointed out that astronomers had things down to such a fine point that the one who made an error of the tenth of a second must improve his methods. He must learn to come down to one six hundredth part of a second. He explained that local causes which would minutely deflect a plumb line would cause an error to occur in the level so that a transit instrument would not give correct observations, notwithstanding the care of the observer. Errors of this kind were not due to the lack of skill of the observer, or the mechanism of the instrument. The error referred to often caused great difference in the record of observers. It seems that they could not secure a catalogue with homegeneous positions until they connected all the observatories and showed the local deflection at each one.

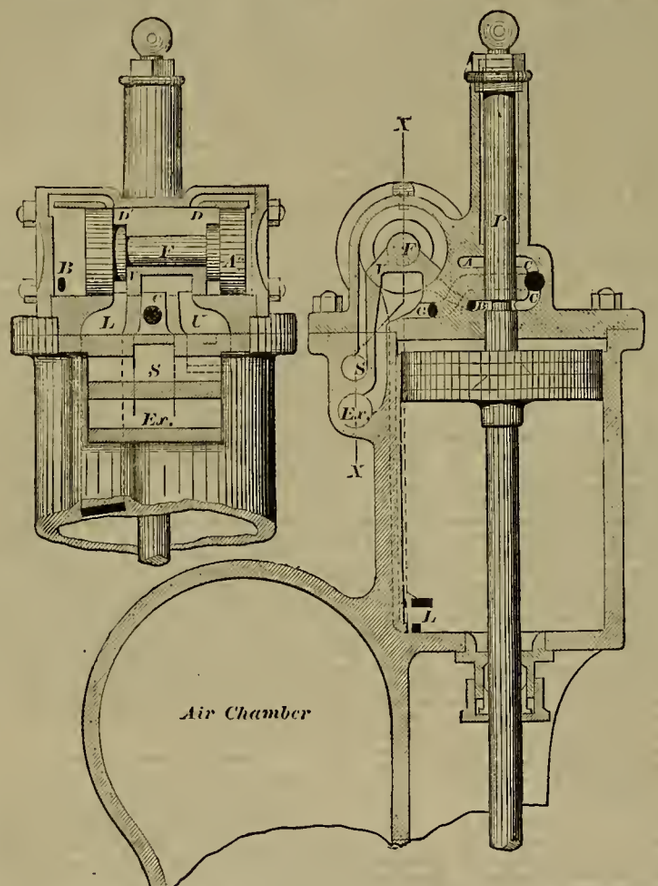
The committee appointed to select the regular ticket for officers to be chosen at the annual election presented the following nominations: President, George Davidson; vice-presidents, H. W. Harkness and H. Herman Behr; corresponding secretary, Samuel B. Christy; recording secretary, Charles G. Yale; treasurer, Elisha Brooks; librarian, Charles Troyer; director of museum, W. G. W. Harford; trustees, George E. Gray, Thomas P. Madden, Ralph C. Harrison, James M. McDonald, Louis Gerstle, C. F. Crocker and R. W. Simpson. Charles Wolcott Brooks and Alpheus Bull, Jr., were elected Judges, and Carlos Troyer and Mary K. Curran, Inspectors of Election, which will be held at the Academy building on Monday, January 5th, from 9 A. M. to 6 P. M.

INTELLIGENCE reached Benson, Arizona, from Lanoria that the reduction works of the Lanoria Smelting Company, at that point, were completely destroyed by fire on the 6th inst. The smelter had closed down for repairs a few days before, and the fire can only be accounted for on the supposition it was the work of an incendiary. The works were valued at $12,500, and insured for $2,500.

THE Candelaria *True Fissure* says: Kinkead, on the line of the railroad, near Hawthorne, is budding into a mining camp quite rapidly, and will make its mark one of these days.

Harlow's Valve Gear for Pumps.

Mr. M. S. Harlow, of Hoboken, N. J., was recently granted a patent for an ingenious and simple arrangement of valve gear for direct-acting steam pumps. This gear, of which sectional views are shown in the annexed engravings, consists essentially of two moving parts, viz., the auxiliary valve P, arranged so as to form a continuation of the piston-rod, and the main valve V, moved by the plunger



SECTIONAL VIEWS OF HARLOW'S VALVE GEAR FOR STEAM PUMPS.

F. The left-hand cut is a section along the line XX of the vertical section. S represents the steam supply-pipe; E *x* the exhaust; L the main steam port to the lower end of the cylinder, and V that to the upper. The operation of the valve is as follows: As represented in the cut, the main piston has reached the upper end of its stroke; the auxiliary valve P has connected ports B and C, exhausting the steam from that end of the auxiliary cylinder. Steam enters the other end through the port D, and thus reverses the main valve. When the main piston has reached the lower end of its stroke the ports A and C communicate over the end of the auxiliary valve P. Steam enters through the port D1, reversing the main valve for the up stroke, thus obtaining a positive motion of the main valve without the aid of tappets, springs, combined levers, cams or similar devices. By the arrangement of the ports in the auxiliary cylinder the piston is prevented from striking the cylinder by means of steam cushions.

Another feature is that, if the main valve should be moved too far by its momentum, the cushion will return it to a fixed point at either end of its stroke, leaving the main steam ports fully open. The main steam ports are divided when they enter the cylinder, so that when the piston approaches the end of its stroke a part of the steam is cut off and the speed of the piston is reduced; also when the stroke is reversed only a portion of the steam at first enters the cylinder, thus giving a motion approximating that obtained by the crank and fly-wheel. This allows the water-valves time to regain their seats without shock, prevents the piston from striking the heads, and, in connection with the steam valve gear, makes a steam pump that is claimed to be practically noiseless at any speed.

THE assessment money due on mines this month is as follows: $421,600 from Nevada, $55,000 from California, $29,000 from Arizona, and $15,000 from Mexico, a total of $520,600. For the corresponding month last year there were eighteen assessments delinquent, amounting to $564,500.

THE Big Bend Hydraulic Mining Company paid a dividend of 3 cents per share, or $6,000, on the 5th. This makes $72,000 for the year.

New Gold Saving Apparatus.

Charles P. Wilson and Leonard G. Gilferd of Candelaria, Esmeralda county, Nev., have invented a new apparatus for saving fine gold. The device is one in which the auriferous sand and earth or gravel is kept in a constant and perfect state of agitation upon the riffle-table by means of a gentle stream of clear water sprinkled directly upon it from above. A lower floor or table is mounted upon and braced by suitable clamping timbers or frames. This table has a slight inclination from one side, at which the perforated feed box is located, down to the other side where the discharge trough is placed, and its surface is provided with longitudinal rifles, thus forming a number of parallel channels in which quicksilver is placed. At one corner of an end of each of the channels is a plugged opening by which the amalgam is drawn off.

The upper table is supported by standards over and in a plane parallel with the lower riffle-table, and has about the same area. At the upper edge of the upper table is a perforated supply box, and at its lower edge is a discharge trough. Both tables are provided at each end with cleats, which form guards, and direct the contents of the tables over the surfaces.

In the upper table are small apertures arranged in considerable numbers. These are countersunk on the upper surface and bulge on the lower surface. They may be thus constructed by a series of small tubes, the upper ends of which are sunk below the upper surface, and these lower ends project below the under surface of the table, or they may be made of the material of the table by hollowing out their tips and rounding off their projecting lower ends to form small conical protuberances, the object in any case being to provide an easy entrance above and a certain clear and distinct discharge below. The protuberances effect this result below by preventing the water from spreading over the under surface of the table and causing it to form into distinct drops, which fall directly where intended.

The operation of the device, which has just been patented through the MINING AND SCIENTIFIC PRESS Patent Agency, is as follows: The auriferous material, with sufficient water to reduce it to a liquid consistency, is fed with the box in the lower table, from which it flows through the perforated side upon and over the surface of the said lower table in a clear layer. Clean water is supplied to the box on the table above, and flows from it over the surface of said upper table. Finding the apertures, it passes through and falls in distinct drops upon and into the layer of auriferous earth or sand below, and keeps it in a constant state of agitation, from which it results that the lighter or worthless portions, or gangue, pass or float over the rifles, and finally reach the trough and are discharged.

The heavier and precious particles remain, however, being caught by the rifles and taken up by the workmen. The excess of water supplied to the upper table is carried off by the trough, and may be used again. This apparatus is of course applicable for saving other particles than gold, for whatever ore be worked the free particles of greater specific gravity may be saved.

BROOKLYN, N. Y., is $38,000,000 in debt.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

The Wood River Region, Idaho—No. 2.

The Principal Towns and Mineral Resources.

[From our Special Correspondent.]

The City of Hailey.

It is only four or five miles from Bellevue to Hailey. The latter town probably outranks the former a trifle in the matter of population. It is the county seat of the immense county of Alturas, which fact contributes largely to its importance as a point of business. Formerly Rocky Bar, located a considerable distance to the northwest of Hailey, was the county seat, but at a spirited and hotly contested election the latter place was selected, and this edict will not be likely to be changed unless the boundary of the county is greatly modified. A brick county court-house has been erected, and a large brick hotel is now being built, which will be ready for occupancy next season. For a considerable time Hailey was the terminus of the Wood River Railroad, but it was extended to Ketchum, seven miles beyond, last year. But Hailey gained such an impetus from the two sources named, that the extension of the road seemed to have no effect in checking its growth, and it is still expanding and increasing in importance and wealth. Besides the railroad connection with Bellevue on the south and Ketchum on the north, where trains run only once a day, there are omnibus or stage lines to these points, and also a stage line to Bullion. There is much traveling to and fro by means of these conveyances, especially to Bellevue, where Johnny Kerns runs the Pioneer line. Johnny knows everybody in the Wood River country, and carries his passengers cheaply and rapidly. The town site of Hailey is excellent, being upon the level platcau of the valley, a quarter of a mile or more back from the river. There are ample places of business for the wants of the region round about, though business does not seem to be overdone. In the line of home industries, we noticed the Hailey Iron Works, where eight to ten men are employed in manufacturing and repairing machinery. Of late the works have been busily employed in making shafting, pulleys, ore cars, etc., for the mining enterprises of the locality. The proprietors will probably erect a foundry next season. W. E. Williams, Esq., is superintendent of the works, and is also agent for the Colorado Iron Works, of Denver. The Jabez Chase concentrator, as well as the mills at Muldoon and North Star, have been put in under the supervision of Mr. Williams the past season.

The Hailey Sampling Works, under the superintendence of W. W. Phillips, Esq., employ from 10 to 15 men. They handle ore in lots of 15 to 30 tons, and have the reputation of doing thorough and reliable work. At the time of our visit they were sampling ore from the Minnie Moore mine. The works have been in operation since 1882. Conklin and Swift, of Salt Lake, are the proprietors. There is a growing business ahead of these works, as the mineral regions contiguous are developed.

Garbutt & Riley, assayers of Hailey, are kept busy by mine owners and prospectors. They are careful workmen, and are doing their share toward the advancement of the Wood River region.

Cliff & Sidebotham handle mining supplies and general hardware, tinware, etc. This is one of the pioneer firms of the place, and enjoys a large business.

With the completion of the brick hotel at Hailey, above spoken of, it will be more than moderately well supplied with conveniences for travelers. At present the Nevada House, S. G. Humphrey, proprietor, run upon the European plan, with restaurant separate, is the best hotel in the place.

At Hailey we met Dr. J. A. Rupert, who is assisting Col. Geo. L. Shoup, of Salmon City, the commissioner of Idaho Territory to the New Orleans Exposition, in a collection of the minerals of Alturas county, for that exhibition. Over 4,000 pounds of fine specimens have been collected by Dr. Rupert and sent forward. He will visit New Orleans, and will assist Col. Shoup in arranging Idaho's exhibit, which, we understand, will be very fine.

Hailey is favored with an enterprising population, who are keen to avail themselves of the advantages which their central position in the Wood River country gives them, and there will be a constant growth of the city as the southern part of Idaho advances in wealth and population. From Hailey the PRESS correspondent took the stage, run by Welch & Co., for

Bullion,

Ten miles to the northwest, where are some important mines. The town takes its name from the Bullion mine, located in the hill close by. The canyon is narrow at Bullion, and the mountain sides precipitous, so that snowslides in the winter season, after heavy falls of snow, are of no uncommon occurrence, and several lives have been lost, as well as much damage done. Accordingly we see a dislike on the part of settlers to remaining here during the winter. Many are preparing to leave next spring. The settlement includes a few stores, saloons, etc., and many miners' cabins, some of them quite tasty and neat, which are scattered along the canyon for a mile or so. At present the most active mining enterprise of the locality is the

Bullion Mine.

The principal owner of this property is Col. E. A. Wall, one of the most enterprising, energetic mining men of the Wood River valley. He is thoroughly practical, and superintends operations at his various properties with his own eyes, which is one reason for his success in the enterprises which he has in hand. The Bullion is a steady ore-producer, employing at present at the mill some 25 to 30 men, and at the mine 60 to 70 men. There is a tramway for ore cars from the mine to the mill, where the loaded car raises an empty one along the side of a mountain with a grade of about sixty degrees. Some 10 tons of first class ore per day are taken out of the mine, besides 25 to 30 tons of second-class ore for concentration, where the latter is reduced at the mill to nearly one-fifth its original weight. The first-class ore and concentrates run as high as 180 to 200 ounces silver to the ton, and are 65 to 70 per cent lead. The Bullion is kept well opened out, and has been, as it will probably continue to be, a productive and valuable property. The superintendent of the mill is J. McFarland, Esq.; superintendent of the mine, Mr. Martin Curran.

Eureka Mine.

This is another property mainly owned by Col. Wall. It is located a quarter of a mile or more above Bullion, in a branch canyon. Concentrating works, with a capacity of 70 tons per day, have just been completed. The machinery was purchased of our friends, Parke, Lacy & Co., of Salt Lake, and it seems to be a model plant. There are five two-compartment jigs, with the necessary rock crushers, Cornish rolls, revolving screens, etc. Like other approved works now going up in other sections, the operations will be largely automatic, so that the force of men required to manage the mill need not be large, probably not more than three or four. The entire cost of this plant was $12,500, which includes steam hoisting works at the mine, the latter costing about $5,000. The Eureka has not heretofore been a large ore shipper, but from now on it promises to be one of the productive mines of Bullion district. The 40 to 45 men now at work will take out all the second-class ore which the mill can handle, besides a supply of first-class ore. It will average 65 per cent lead, and carries 90 to 100 ounces silver to the ton. It will probably be shipped to Beaver or Omaha.

The Mayflower.

Until recently this mine had employed a considerable force of men—80 or more—but shortly before our visit it had been closed down by the superintendent, G. L. Havens, Esq., for the purpose of waiting the action by Eastern owners upon a proposition which he had made to them concerning future operations. This mine makes a good showing for the time that it has been worked. Its purchase price has been repaid to the owners, and several dividends have been declared. But at present the ore bodies are closely worked out, and there must be a large expenditure of work in developing along the ledge. Mr. Havens expresses the utmost confidence in the value of the mine, and the certainty of again striking the ledge which has "pinched out," if work is properly pursued, so that it is probable the Mayflower will again resume in the spring, if not before. It has produced ore for the last three years that has averaged in value $230 per ton, being 64 per cent lead, and carrying 176 ozs. silver. Eighty men are employed. The concentrator handled 75 tons of ore per day.

O. K. Mine.

Close to Bullion, employs 15 men; has taken out 150 tons of shipping ore the present season; 700 to 800 tons since opening. The owners are Salt Lake parties, R. C. Chambers, of the Ontario mine, being one of the principal owners. Thomas Gibbons, of bullion, is superintendent. The ore averages 70 per cent lead, and carries 136 ozs. silver to the ton. We look for good reports from the O. K. in the future.

The Idahoan.

This mine is about a mile from Bullion. Its mill is in the main canyon, half a mile below town. The ore is carried by ore wagons from mine to mill. As may be known to the readers of the PRESS, the Idahoan has lately been sold to English capitalists, who will soon assume management. At present about 10 tons of ore per day are shipped, including the concentrates from the mill, which are about one half of this amount. The ore is quite uniform in quality, that of the first grade containing 120 ozs. silver to the ton, and being about 70 per cent lead. Twenty-five to thirty men have been employed at the mine, and six men at the mill. We presume when the new owners assume control this force will be increased. Mr. A. P. Turner was the discoverer of the Idahoan, and is one of the parties who has lately disposed of his interest. The other owners were T. J. Edgington, of Bullion; V. S. Anderson, of Hailey, and Wm. Nye, of Boise City. Mr. Edgington has acted as superintendent, and the new proprietors will do well, we think, to retain him in that position. The deepest workings at present in the mine are at the 350-foot level. The concentrator is a fine plant, having a capacity of 30 tons in 12 hours.

The Narrow Gauges.

We regret that we are unable to report the state of work at the Narrow Gauges. The properties are about three miles from Bullion. There is said to be promise of a large production of ore from this region in the near future.

Miners' Union.

There is a strong combination of miners at Bullion, which has succeeded in maintaining prices for labor in the mines at $4 per day. The Union owns its own hall, and its meetings are largely attended each week. We learn from Mr. James Gunn, the president, that the president, that the purchase of a small library for the Union is contemplated. This will be a wise investment, and one which will contribute much to the amusement and profit of the members.

From Hailey the PRESS correspondent took an evening train for

Ketchum.

This is now the terminus of the Wood River branch of the Oregon Short Line Railroad. The citizens of the place contributed liberally for the extension of the road from Hailey, and although before its completion Ketchum was a lively burgh, it is now a town rivaling in size and business the villages below. It has a population of 1,200 or more, and has a few places of business superior in style and extent to any of Hailey or Bellevue. The town presents a fine appearance, its dwellings being neat and trim, and the general arrangement of the the village is regular and fine, upon a level town site a short distance back from Wood River. The valley is here somewhat more narrow than at the other places, and the overlooking mountain hights more precipitous. It seems hardly probable that the railroad will he extended into the rather abrupt mountainous region beyond Ketchum, so that it will be for many years the railroad terminus, and therefore the seat of a growing business. The principal industry of the town at present is that centered at the

Philadelphia Smelter,

So named from its being owned mainly by Philadelphia capitalists. This is a splendid plant. It has a capacity far beyond the requirements of the work which comes to it as yet, and could easily handle much of the Wood River product which goes to distant smelters in the East or to the South. The works are located upon a bench of land above the level of the river, and are supplied with ample water power from Warm Springs Creek, which here enters Wood River. There are two water-wheels of forty-horse power each. There are numerous kilns, for burning charcoal, the wood for which can be floated down the streams. The necessary coke is brought from Pennsylvania. There are four stacks or blast furnaces, but at present only two are in operation, each of which reduces 20 to 25 tons of roasted ore per day, which comes from the five reverberatory furnaces. The grounds and buildings are commodious, the former supplying ample room for roasting ore in heaps, and the latter plenty of floor-room for the sampling works which are connected with the smelter. The present supply of ore comes entirely from mines within a radius of 15 miles—the Elkhorn, Ontario, Deer Trail, Blue Jacket and many others. About 50 men are employed. Geo. B. Moulton, Esq., is superintendent of works; H. J. Hareless, superintendent of smelter. We hope to see the day when this magnificent plant will taxed to reduce the ores which will naturally come to it, and we believe that time is not far distant.

Ketchum Sampling Mills.

These are being erected by Salt Lake parties. They are located close to the depot; convenient for handling ores. The machinery is now being put in, and work will soon commence. This machinery was bought at Denver, from the Colorado Iron Works. Ten or twelve men will be employed. Wm. McKay, Esq., of Salt Lake, principal owner; Joseph J. Taylor, manager at Ketchum.

The Elkhorn Mine.

This mine was purchased of original parties in 1880, for $13,000. Since then it has paid $280,000 in dividends. It is producing from eight to ten tons per day, which, as before indicated, is reduced at the Philadelphia smelter. There is on hand a large reserve of second-class ore. Twenty men are employed at the mine, under the superintendence of Judge I. I. Lewis, one of the pioneers of Wood River, and part owner in the mine. Mr. A. Griffith is his foreman. Four tunnels penetrate the hill and touch the ledge, the lower of which runs in 300 feet and strikes the vein 700 feet below surface croppings. The other owners of the mine, with Judge Lewis, are T. S. Hanser, A. M. Holter and R. S. Hale. Judge Lewis is also superintendent of several smaller mining properties in Wood River region, on Indian creek, etc. He is one of the leading and enterprising citizens of Ketchum, is president of the First National Bank, and organizer of other institutions for the advancement of his locality.

The Parker Mine.

The principal owners of the Parker are Idaho men, with W. H. Walt, Esq., of Hailey, superintendent. The mine has been worked for about two years. Additional machinery for increased ore production is now being placed in position, and as the ore which has heretofore been shipped has been exceptionally rich, we may look for a brilliant record for the Parker. At present about forty men are employed. We were taken through the underground workings of the mine by the foreman, Mr. Joseph Somers, and were struck with the developments and exposures of rich ore. The vein matter lies between well-defined walls of coal-like rock, and through this ore body—varying in width from one to five feet—there is a pay streak of first-class ore which runs uniformly higher in silver than the ore from any other mine that we have visited—viz., 200 to 480 ozs. silver to the ton, 50 per cent lead. The mine will soon yield 15 tons of ore per day, which will probably be sent to Kansas City for reduction. This mine is located on a steep side hill, about six miles from Ketchum. At the foot of the hill is stationed the air compressor which will furnish power to run drills in the mine and the hoist at head of incline. Across the canyon from the Parker is the

Quaker City.

A comparatively late location, and as yet almost an undeveloped mine, though an ore producer to the extent of a carload or so per month. Here 10 or 12 men are employed. Developments are continued with hope or prospects that as depth is attained, a continuous ore-vein may be struck. At present the ore pockets are scattered, and the vein lacks uniformity. Prof, Jenny, of Hailey, is superintendent here.

The Ontario Mine.

This is the principal property of the Warm Springs Consolidated Mining Co., located up the creek, a few miles above Ketchum. The capital invested is mainly from Boston, Mass. Col. J. H. Moyle is Superintendent, and to his energetic and able management is due the present fine condition of the mine. A year ago he found it to be comparatively destitute of ore, but upon assuming control he abandoned the old works, found new ore bodies, and has since developed the mine extensively. It is said there are now over 30,000 cubic feet of ore in sight, 2,500 feet of tunneling, drifting, etc., with underground connections 700 feet in length. Fifty men are employed at the mine. The company owns a concentrating plant, put in under Supt. Moyle's management, at an expense of $15,000. This is run at comparatively light expense, as the machinery is largely automatic and perfect of its class. The expense of concentration does not exceed $2 per ton. The capacity of the works is 60 tons of crude ore per day, which is reduced to about 15 tons of concentrates. The first-class ore and concentrates run from 60 to 72 per cent lead, and carry 100 to 140 ounces silver to the ton. There is quite a reserve of concentrating ore on the dumps of the mine. The ore from the Ontario goes to the Philadelphia smelter.

Other Mines on Warm Springs Creek.

The Black Horse mine joins the property above described, on the northeast. It is a good property, and has shipped considerable fine ore.

The Buzzo Gold and Silver Mining Co. have recently opened up a large body of ore in their property, of high grade, 190 ounces silver to ton, 65 per cent lead. Mr. Thos. Buzzo is deserving of much credit, for the persevering manner in which he has prosecuted the development of this property. Had many men met with similar discouragements, they would have thrown up the entire concern, but industry, careful management, and the pluck of a California man have caused the addition of another to the list of paying properties in Wood River district.

The Lucky Boy, in Bassett Gulch, also the Keno, Great Western and Shoo Fly, in same gulch, are promising prospects, and bid fair to become large producers another season. The Justice, owned by Major Mensch, Boyd Park of Salt Lake, and other parties, is another good prospect. Major Mensch is on the ground, attending to the interests of the property. The Aloa is on the same hill, as is also the St. Julien, both good prospects, seemingly, needing only development to bring them to the front. The Blue Jacket, owned by L. Schweitzer, Esq., and others, has produced some good ore, and will yield still further as developments progress.

Altogether, there are fine prospects in Warm Springs District. We are promised additional facts concerning this district, as well as items from the entire Wood River section, from Major Mensch, of Ketchum, who takes a deep interest in the progress of Idaho, and who is well-informed in mining matters.

Business Notes.

For the benefit of travelers, we wish to speak of the Palace Hotel, at Ketchum. It is run upon the European plan, and has a fine restaurant in connection. Mrs. Himes, a genial and competent landlady, has charge of the lodging department, where can be found clean rooms and good beds. There are other good restaurants in Ketchum—the Cornucopia, kept by John Murray, and the Enterprise, R. C. West, proprietor, being the best, both located on Main street.

A. Adams, Esq., has an extensive lumber yard at Ketchum, where he manufactures many descriptions of building material, having steam planing mill and other machinery.

J. B. Reiff, is the leading watchmaker and jeweler of Ketchum. He carries a fine stock of goods in his line.

MECHANICAL PROGRESS.

Pittsburg Teaching England to Make Steel.

The English correspondent of the American *Manufacturer* says in a recent letter:

"The people who at one time were so forward to condemn the possibility of such a thing ever taking place as has now happened, have had a little more of their consequence taken out of them by learning that Mr. Edgar Richards, the eldest son of Mr. E. Windsor Richards, of Bolckow, Vaughan & Co., Middlesborough, is over at Pittsburg, where he is temporarily engaged at the Edgar Thomson Steel Works, learning the business of steel making on American principles. The men who have come home from America have brought with them wrinkles which they esteem of value. Amongst them are Mr. Wm. Munroe, of Messrs. Jennings & Co., of Middlesborough; Mr. Theodore Fox, of the Newport Rolling Mills in the same town, and Mr. Thomas Wrightson, of the Teesdale Iron Works, Stockton; while when Mr. Edward Williams, of the Linthorpe Iron Works, Middlesborough, who has just started to your side, accompanied by Mrs. Williams, has returned, there will be a notable addition to the number who will be able to swell the volume of praise which is ever heard when an Englishman who knows something of iron and steel making, and has watched the style of doing it in the States, gives his friends the benefit of the views which their trans-atlantic journey has developed."

EARLY COMPOUND ENGINES—AN ITEM OF HISTORY.—A correspondent of the *Journal of the Franklin Institute* says that compound engines are not so recent an invention as many suppose. He says: "The first compound engines are said to have been built by Mr. I. P. Allaire. As early as 1830 and 1832 there were on the Hudson River two steamboats with compound engines, the *Swiftsure* and *Commerce*. Their engines were of the upright square form, or cross-head pattern (very few of that form now in use, and none built), the high-pressure cylinder being forward and the low-pressure being abaft the paddle-wheel shaft, and both connected to it by cog-wheel gearing. About this same time the *Post Boy*, with similar machinery, built by Mr. Allaire, was sent to New Orleans. In the machinery of the above steamers the exhaust steam of the high-pressure cylinder passed directly to the low-pressure cylinder without the intervention of valves or receiver between the two cylinders. The *Swiftsure* and *Commerce* were in use for several years, and the machinery of the former subsequently taken out and replaced by the ordinary beam engine. The compound engine, built by the late Erastus Smith, was of the ordinary beam pattern, except that it had two steam cylinders, the high-pressure being *within* the low-pressure one. Their diameters were thirty-seven and eighty inches, and stroke of piston eleven feet. This form has not been duplicated. This present compound engine has practically but little resemblance to those that preceded it, and is very much more economical.

AN EXHIBITION OF LABOR.—The project of an exhibition of labor, to be held in 1885 in the Palace of Industry at Paris, has been ventilated, and will be realized through the efforts of the Hon. M. Dueret, President of the Chamber of Industries. M. Dueret has frequently remarked that at the exhibitions of Vienna, Paris and Amsterdam, the departments of labor always attracted the largest attention on the part of the visitors. He has declared that the multiplication of technical instruction is one of the principal remedies against industrial crisis, and, therefore has taken preparation to realize this project of an exhibition in which the process of manufacturing from the raw material to the finished product is to be illustrated. A visit to such an exhibition will be equal to visiting a number of factories and workshops. Certainly the process of all the industries cannot be represented, partly owing to complications and partly owing to sanitary considerations, but such processes are to be represented by models and plans; also certain processes of industries which may be insufficiently protected against public curiosity by patents and trademarks will only be represented by finished products. This exhibition, being destined for technical education, undoubtedly merits the fullest attention of manufacturers and merchants.

THE INTRODUCTION OF STEEL NAILS.—Marked progress is recorded in the manufacture of steel nails; and recently it has been seen that efforts to market the goods are meeting with remarkable success. Considering the present heavy production of iron nails and consequent low prices, the fact that the new article has gained any footing whatever augurs well for its permanent position in the future. That the steel nail can be manufactured as cheaply as the iron one is a question upon which the parties directly interested throw very little light, for obvious reasons. According to respectable authority, "the indications are plain that wide-spread preparations are being made for the manufacture of steel nails." There could hardly be a basis for a statement of this kind without corresponding reason for the belief that some means have been discovered whereby material for steel can be procured as cheaply as that for iron nails. As already intimated in these columns, the steel nail encounters more or less prejudice from consumers in some quarters; but as an obstacle to its future progress this is said to be a mere trifle compared with what steel rails and other steel substitutes for iron were met with when first introduced.

ART IN IRON.—The works of art in the recent Mechanics' Exhibition in Boston, according to the Hartford *Post*, were pronounced the finest that had been presented on any former occasion, the possessors of fine pictures having loaned a large portion, and contributors having unusually ambitious to appear in the splendid gallery reserved for them. Among them all were none that attracted more attention and received higher praise than the pictures in iron castings exhibited by the Magee Furnace Company of Chelsea. It seemed almost passing possibility that such delicacy and grace could be embodied in a fabric so long devoted to merely coarse purposes, and it was a wonder, even more that such elegant pictures could have been produced in iron, that it should have been accomplished at all. They needed but color to render them companions for the art galleries or parlor walls, which places they obtain, framed like pictures or made to serve as tiles, far more beautiful than even the nicest specimens of the keramic art. Mr. Magee conceived the idea of their production years ago, and his conception resolved itself into fact, until it has become an art in itself.

WASTE OF OIL.—An old machinist of nearly 50 years' experience, stated in his shop recently that he had run a countershaft, which he pointed out, on five drops daily of oil, the shaft being one and a half inches diameter and having three bearings in hangers. "Yet," he said, that shaft has never squeaked." The shaft carried pulleys which drove a drilling lathe, a polishing and wood turning lathe, a small screw cutting lathe, and a grindstone. Most of the weight of these pulleys was between the two hangers, on which he lavished two drops of oil a day. He kept his shaft level and in line. The belts pulled almost equally. The boxes were babbitted. The shaft made about 300 turns. The experimenter said that he had tested oils as well as quantity. He believed in clear animal oil—whale or lard. He felt assured that good oil was wasted wherever drip pans were used, and he never used them. There is a text here for establishments to sermonize over, where the shaft hearings drip oil and the floors are soaked with it.

THE CRUCIBLE.—If what was put in a crucible came out of it, says the *Age of Steel*, in an article on "Brass Castings," there would be less diversity of results. What with the volatility of some metals and the varied melting point of others in the same mix, it is wonderful that anything like uniformity can be obtained in ordinary work. Zinc sublimes—burns away—at 773° to 800°, while the heat of the metal with which it should be intimately mixed in making yellow brass—copper—is nearly 2,000°. Zinc, tin and lead enter into composition of copper to form alloys in varying proportions—always in definite quantity—for a given alloy. It will be seen, therefore, from the ease with which the lesser metals are burned away at comparatively low temperatures that it is a very easy thing to make several kinds of metal out of the same mix. The *Engineer* adds the fact, too well known to amateurs, that copper often manifests a remarkable proclivity for leaving the casting-house, which further complicates the question.

ELECTRICITY AND THE STEAM ENGINE.—One of the results of the wide development of the resources of electrical science in the last few years, and especially of the general introduction of the electric light, has been the necessity of important modifications in stationary steam engines. New conditions have been required as to efficiency, regulation and smooth action at high speed of rotation; and perhaps in no one direction of late have the efforts of students of steam engineering been more diligently applied than in meeting this fresh demand upon their skill. This subject is ably treated in a work by Prof. R. H. Thurston, of the Stevens Institute of Technology, entitled "Stationary Steam Engines, especially as adapted to Electric Lighting Purposes."

COUPLING STEAM ENGINES AND WATER WHEELS TOGETHER.—An engineer says: "Steam engines coupled onto water wheels seldom work well together. A large machine shop and foundry in Ansonia, Conn., formerly had a 600-horse engine, which they tried to run conjointly with a water wheel. After numerous breakages they gave up the attempt, and ran them separately. This concern has turned out some of the best mechanics in the country. If both motors were speeded alike, and the head of water constant, it seems to me they ought to work; it is evidently a safer, surer mode of working to have them separate. You then know what each is doing."

CHILLED IRON is the most impenetrable of all metals. In warfare it is the only sure defense against the heavy modern guns. A plate of chilled iron may be thin enough to be shattered, but never penetrated.

AN EXPOSITION BUILDING is to be erected in Pittsburg to cost $250,000,

SCIENTIFIC PROGRESS.

Progress in Electrical Development.

Electricity is still making rapid progress in its application to useful and industrial arts. The recent electrical exhibition at Philadelphia seems to have given a new impulse in this direction, which is being manifested in various ways.

Electricity as a Motive Power.

In recording the progress which is being made, we notice first that a dispatch from New York says that the first experiment with electricity as a motive power on the elevated railroads of that city will soon be made on the Second Avenue line. A central rail, twenty pounds heavier than those now in use, will be laid between the present rails, to which the electricity will be conducted from the dynamos. This central rail will be thoroughly insulated. The experiment will be made only upon the road named, but in the interest of all, and the expense of this trial will be divided between them. A commission to be selected by the companies will decide on the relative merits of the various devices and inventions which may be experimented with. This regulation of the speed of trains, it is said, will be less difficult with electricity than with steam. Trains can be stopped more quickly and at all times will be under more perfect control. They will be run with increased safety and less noise, while smoke and cinders will be avoided altogether. The cost of working the road will be greatly reduced by the use of electricity if the experiments should prove successful. It is safe to say that within a year all the elevated railroads in New York will be run by electric motors.

Electricity Displacing Watchmen.

Application has been made by Pittsburg parties for a charter for a corporation whose projectors claim will control a system for the prevention and detection of burglaries and fires, which will not only throw private watchmen out of employment, but make Pittsburg an exceedingly unhealthy place for law breakers generally. The corporation is to be known as the Stern Electric Alarm Company. The manner in which the plans of burglars are to be frustrated is thus explained: Central stations will be established and at each a good force of careful and experienced officers will be located night and day. Banks, business houses and private residences will be connected with these stations by wire, and will be so completely protected that even persons who have a right to do so, cannot enter without the central station being notified. The plan is very simple. Windows and doors will be supplied with simple electric appliances in such a manner that their presence cannot be detected. The instant an attempt is made to open a door or raise a window, a gong in the central office will ring, and an annunciator similar to those used in hotels will indicate the number of the building entered. The wires will be so fine that a coil weighing one pound is three miles long, and they will be so close together that even if their presence or location is known, entrance cannot be effected without breaking or disturbing one or more of the wires, and so sounding the gong in the central office. One or more men will answer each alarm in three minutes. The intruders will not know that an alarm has been sent in. The electric current is also to be utilized in the detection of fires. Ceilings and other portions of buildings will be studded with instruments so susceptible to heat that a match held for a quarter of a second within six inches of one will cause it to ring a gong miles distant. It is said that the cost of the apparatus and attention will be much less than the present cost for private watchmen, and much more effective.

Lighting by Electricity.

Illumination by electricity is also making rapid progress. The manager of the New Orleans Exposition has awarded the entire lighting of all the buildings of the Fair ground to the several leading electric light companies. Contracts have been awarded to five different companies, who have set up in all 6,100 lights, the total cost of which will be $100,000.

A NEW PROCESS IN SUGAR-MAKING.—Louisiana planters are directing their attention to a new process for extracting sugar, invented by Konrad Trobach, of Berlin. It is purely chemical, differing materially from the mechanical process now used, and if it shall prove to be all it is claimed to be, will effect a revolution in sugar-making and cheapen the article still more. Trobach's process dispenses with crushing and pressing altogether; the cane is cut into slices by means of machinery, and the water extracted from it by alcohol vapor, which, having an affinity for the water, absorbs it, but leaves the saccharine in the desiccated cane. This is then treated with liquid alcohol, which extracts the sugar, and afterwards the sugar is extracted from the alcohol, or the alcohol from the sugar, by filtering through lime and chalk. One great obstacle to the cheap manufacture of Louisiana sugar, is the difficulty of extracting all or nearly all the saccharine from the cane; a considerable portion is lost in the bagasse or refuse, which is thrown away or burned. If this waste could be saved, it would cheapen the process one cent per pound. The present sugar-making machinery in Louisiana, would be an impediment to the introduction of the Trobach method. It is not adapted to the new process, and would have to be thrown away—a sacrifice which the Louisiana planters could ill afford, as their machinery is very costly. The process is quite similar to that used for extracting the saccharine matter from beets in the manufacture of beet root sugar.

THE LICK OBSERVATORY.—Work on the Lick Observatory is progressing in a most satisfactory manner. The Observatory building will be completed, all but the dome, by the last of January next. The dome, which will be the largest in the world, cannot be completed until the work has progressed far enough to determine its focal length. The great disc, upon which money and labor was spent in vain until nineteen glasses had been cast and thrown aside as worthless, has finally been cast in a successful manner—in fact, two discs have now been successfully cast, one of which will be immediately forwarded to Alvin Clark, of Cambridge, by whom it will be ground and properly shaped. The cost of the work involved in this Observatory will be $700,000. Captain Frazer estimates the outlay up to January 1, 1885, at $250,000. There must be paid to Feil at least $51,000, and probably it will be necessary to expend upon the dome in placing the telescope in position, etc., $125,000, making a total of $426,000, which will leave a balance in the fund of $274,000, interest not computed. Since either of the discs cast by Feil will, in the opinion of Mr. Clark, answer the purpose, it is comparatively easy to make an estimate with some approach to accuracy. Mr. Clark, it is learned, will require about eighteen months to give the proper figure to the glass.

PRACTICAL SCIENCE.—European naturalists regard the attention paid in this country to economic entomology, and the aid that has been given it by various States and the general Government, as one sign of "a practical people." With all the specialization in instruction in the foreign universities, we are not aware that there is more than one which supports a professorship of entomology. This is Oxford, where the venerable Prof. Westwood honors the Hope foundation. In this country Harvard and Cornell each have their full professorship of this science, and to the latter a summer school, having special reference to agricultural entomology, has now been attached. This seems more appropriate than any of the summer schools now so much in vogue, inasmuch as the objects of study are at this season in the hight of their investigations into the power of crops to sustain insect life. To further the interests of the school, the trustees of Cornell University have relieved Prof. Comstock of his duties during the winter; and an unusually good opportunity is thus afforded to teachers, as well as others, to familiarize themselves with the principles of this branch of economic science.

INTERESTING EXPERIMENT.—If mercury in a glass, says an exchange, is covered over with water slightly acidulated, into which is plunged an aluminium wire, and if the mercury and the wire are connected with the negative pole of a battery of two Daniells, while a platinum plate immersed in the water is connected with the positive pole, the surfaces of the wire and of the mercury are deoxidized by the hydrogen gas evolved. If the wire is then plunged down into the mercury it becomes moistened, which did not take place previously, and is amalgamated. On exposure to the air the surface becomes dull, flocks of alumina appear and separate from the wire. Iron may be amalgamated in the same manner, and in time the mercury rises up along the immersed wire.

COBALT EXTRACTION.—According to a process patented by Messrs. Herrenschmidt and Constable, of Sydney, the ore is crushed and the percentage of oxides of cobalt ascertained; then sufficient sulphate of iron is added to convert the oxides into sulphates, and water added till it is the consistency of thick slime. Then it is boiled for an hour, when the whole of the oxides will have been converted into sulphates and held in solution by the liquor. The thick residue is then washed, so as to remove every trace of sulphates, which may then be treated with any of the well-known materials for reconverting sulphates into oxides.

BALLOONING.—A famous aeronaut says that no balloon has ever gone over a second sunset. The moment the sun goes down the gas condenses, and you get through the night better than the day. But the next day, in the presence of the sun, the gas expands and you mount to great elevations, but every mount the balloon makes cripples its power, and it is only a question of hours, if not minutes, how long you can keep up. If an aeronaut could have 48 hours of night he could travel a great distance. The highest rate of speed he had ever attained, even with a strong wind blowing, was 80 miles an hour.

AN ELECTRIC GATE OPENER.—It is said that the French railroad companies are about to adopt an electric gate opener. A catch connected with an electro-magnet keeps the gates closed. When a train approaches it closes the circuit, releases the catch, and the gates fly open. The last train as it passes through opens the circuit, and the gates are again closed. The same apparatus rings a bell violently on the approach of a train.

MINING AND SCIENTIFIC PRESS.

A. T. DEWEY. W. B. EWER.

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W. B. EWER.....SENIOR EDITOR.

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SAN FRANCISCO:

Saturday Morning, Dec 20, 1884.

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☞ *See Advertising Columns.*

Passing Events.

The first good rain of the season has been falling all over this State during the past few days, much to the joy of the farmers and miners.

People are preparing for the Christmas holidays, and before another number of the PRESS will be issued Christmas Day will have passed. This is our only opportunity, therefore, of wishing our patrons the compliments of the season, which we do most heartily.

There is no news from the mines of special interest aside from what we mention in our mining summary. Miners are every where busy doing their annual assessment work to save them from being jumped. It behooves every one who has a claim that has not been worked last year to see closely after his interests before the 1st of January.

The withdrawal of all miners but a prospecting force from the Standard Consolidated mine, and the closing down of the Standard-Bulwer mill are severe blows to the Bodie. The announcement was received with great regret by the miners and business community generally.

CORRECTION.—In the letter of our correspondent from French Gulch, Deadwood, Trinity county, published in the PRESS of Dec. 13th, he stated by mistake that the Washington mine had paid $500 in dividends, when it should have been $500,000.

Deep Mining.

Two weeks ago in the MINING AND SCIENTIFIC PRESS mention was made of the resolution of some of the mining companies engaged on the Comstock lode to virtually abandon work on the deepest levels. They have been working for a long time at a great disadvantage, and have found nothing. The elaborate borings made from the winze of the 3300 level of the Mexican developed no ore that would pay. Their borings were extended in every direction, the work being done at the joint expense of several companies.

There is still, however, a great deal of ground three or four hundred feet higher up which has never been fully explored, and the companies intend to turn their attention to these parts of the mines for the present. If anything of value is developed, and the mines can pay for work lower down without stockholders having to put their hands in their pockets, then perhaps deep prospecting will again be indulged in. It must be remembered that even where they now propose to prospect they are some 2,700 feet underground, and that the cost of mining at such depths is greater. The intense heat, the vast bodies of water which must be drained, and the expense of hoisting, etc., are all drawbacks to mining on this great lode.

In accordance with instructions, the managers of the north-end mines have been for the past week stripping the levels below the 2700. The air-pipes, car-tracks, pumps, etc., are all being taken out. When the entire material has been transferred, the lower levels will be abandoned and allowed to fill up with water. Nothing of value having been found after very extended drilling in every direction at the lowest levels, it was found that stockholders would not pay assessments to carry on work there any longer.

The resolution to abandon these lowest levels was received with favor by the miners on the lode, who believe there is more favorable ground higher up, which has not been properly prospected. They think there is a better chance of more steady employment being given to men if these levels above are worked, for they believe there is more chance there to find pay ore.

Idaho Mines.

Within the past few years Idaho has made very rapid strides in developing her mineral resources. For a long time her principal mining fields were in the Boise basin and at Owyhee. The scandalous stock transactions which occurred some years ago, in connection with the quartz mines at War Eagle Mountain, did great harm to the Territory. Many persons would, for a long time afterwards, have nothing to do with Idaho mines. The rascality of a few stock manipulators did injury to the whole Territory, for it was very difficult to get capital interested in even the very best mineral properties. Since the discovery of the rich and productive Wood River region, the Coeur d'Alene, etc., this has changed, and there are many mines and reduction works turning out millions. The letter of our correspondent from Wood River, given in another column, and one from the same source in the PRESS of last week, show the advance being made in that region and the progress of development.

It will be seen from the description of the Wood River country referred to, that there are found, within a comparatively limited region, a large number of productive properties, besides a larger number of mines which give promise of fine results in the immediate future. From Bellevue to Ketchum is about 12 miles, and along the river valley for this distance—diverging, of course, into branch canyons or valleys—there are mines enough to give employment, as developments progress, to thousands of miners. The output of ore and bullion from this region during the past season will be fully $15,000,000. If no untoward event disturbs the mining industry during the coming year, we look for a large increase in investments, for more energetic developments, and for much larger returns from this promising district. The valley is filled with a wide-awake, intelligent population, who, while they invite assistance and co-operation from abroad, do not lay on their oars to await such help, but they are doing by themselves what they can to develop the hidden resources of their rich mineral belts. They are making a showing which commands attention abroad, and in due season we shall see Alturas county well in the van of the mineral-producing sections of our great country.

Arctic Explorations.

On Tuesday evening, Dec. 2d, Judge Hosmer gave a very interesting address before the San Francisco Geographical Society, on the life, character and public services of Dr. Kane, touching incidentally upon polar explorations in general. The lecturer commenced with the boyhood of the famous arctic navigator and depicted in a most eloquent and interesting manner the way in which young Kane, during his youth, laid the foundation for the grand success which crowned his early manhood—how the boy foreshadowed the man. The address was a most complete word picture of the life of the great explorer and received the most earnest attention of an appreciative audience.

The benefits to be derived from arctic explorations is a matter upon which there is great difference of opinion. The preponderance of opinion, however, seems to be decidedly in favor of continued effort. The benefits both practical and scientific already attained are of great value. By them much geographical knowledge has been added to that branch of science; we know more of the history and character of the planet on which we live; we have a better knowledge of the great ocean currents, their causes and effects. Arctic explorers have located the true magnetic pole and given us some insight into the causes of the variations of the magnetic needle and the laws by which these variations are governed, all of which are of inestimable value to every vessel which sails upon the ocean. Much light has also been thrown upon many other obscure points of geological and physical investigations.

Judge Hosmer, in referring to the general subject of Arctic explorations said:

"As each successive expedition to the Arctic proves unsuccessful in its search, and one after another each company of explorers succumb to the rigors of the climate, no questions are oftener asked than these: Why continue these explorations? What practical good can the world derive from a successful voyage to the pole? Have we not sacrificed life and property enough in the fruitless search of a fruitless object?

"I reply: Is it not something to have discovered the position of the magnetic pole, and the geographic range of the lowest temperature? Was the discovery of the current system of the ocean, and the demonstration of its circulation from the tropics to the poles, bearing its arterial heat and returning the great centripetal tides nothing? Has the discovery of the northwest passage settled no question of interest?

"Arctic explorations within the past half century has done as much for physical geography as the labors of the same period have accomplished in any other department of natural knowledge. But how much remains yet to be derived from it? 'Within the Polar sea,' says an accomplished writer, 'is the treasury of the ocean tides: there is the nursery of that migratory life which fills the sea and air of the northern temperate zone; there the wondrous compensations of polar and tropical forces are displayed; there stands the observatory of the globe, its chemical laboratory, the theatre of its meteoric exhibitions, and a thousand secrets besides to enrich the natural sciences, and to correct and adjust all that we already know of the system of our planet, in accordance with the truth and beauty of its paramount laws.'"

We would like this occasion to say that the Geographical Society has been quite fortunate in securing the active assistance of so ripe a scholar and such an eloquent writer as Judge Hosmer. His address, given a few weeks previous on the antiquities of America, was one of remarkable interest, and evinced a thorough acquaintance on the part of the speaker with the subject under discussion. It is to be hoped that the Judge has yet other matters in store such as will interest and instruct the members of the Society and such of their friends as may be so fortunate as to secure cards of admission to their assemblies.

Dr. Kane thus summarizes the discoveries and surveys embraced in his chart:

(1) Nine hundred and sixty miles of coast line delineated, which was effected by two thousand miles of travel on foot, and by the aid of dogs.

(2) Greenland traced to its northern face, where it is connected with the farther north of the opposite coast by the glacier of Humboldt.

(3) The survey of the great glacial mass the mighty crystal bridge which connects the two continents of America and Greenland, sixty miles in length.

(4) The discovery and delineation of Washington, and separated from the American land masses, by a channel of but 35 miles in width, while the great glacier puts at least, 60 between it and Greenland, and therefore is regarded in geographical continuity with the American continent.

(5) The discovery and delineation of a large tract of land, forming the extension northward of the American continent.

(6) The discovery of a large channel, claimed as the polar sea, northwest, free from ice, and leading into an open and expanding area, equally free—the whole embracing an iceless area of 4200 (square?) miles.

The ice barrier, which forms the crystal link between the known and unknown northern seas, bears the name of Kane.

Care in Blasting.

For the past year or more we have heard considerable of English experiments to do away with the use of powder in blasting in coal mines, so as to prevent the accidents occurring. In that country there have been very stringent regulations adopted in the matter of blasting in coal mines, and there has even been a demand that it should be prohibited altogether by law. Very elaborate experiments with the use of lime, etc., have been carried out to see if a substitute for powder could not be found. Many of the substitutes have been abandoned, as nothing is found equal to powder for doing the work cheaply, quickly and surely, and it has been reinstated to its former position.

On the continent of Europe, however, they have kept on using powder, and do not seem to have had much trouble with it. Mr. Geo. J. Andre, a writer who is a close observer, points out the fact that powder is used with much more care on the continent than in England. He says the charge is commonly contained in a cartridge, duly proportioned to the work to be done, and every precaution is observed to avoid blown-out shots. Care in one direction leads to care in others, and the miner who is mindful of the effects of his shot is likely to take thought of the presence of explosive gas. What is needed is not abolition of shot firing, or even the imposition of further embarrassing restrictions, but a more intelligent handling of the explosive. Were a little plain common sense exercised and an ordinary degree of intelligence displayed, such as befits a dangerous occupation, we should not often hear of an explosion resulting from shot-firing. The danger lies in the abuse, not in the use; and against the abuse there are restrictions enough already.

Colliers' Risks.

It is popularly supposed that the occupation of a coal miner is believed to be the most risky of any following the calling of mining; the coal miner also believes this. The study of statistical tables, published by foreign Governments, however, seem to disprove this theory. In these tables they will learn that the risks in some other occupation, are not merely equal to their own, but notably greater. The *Annuaire Statistique* of Belgium, issued by the Minister of the Interior, contains a striking comparison bearing on this fact. Four years of accidents in coal mines are compared with those of a like period of time, on the railways of that country, the employees only being taken account of. The period is from 1879 to 1882 inclusive. It should be borne in mind in making this comparison, that during these years, some of the most destructive of firedamp explosions took place. In 1879, one of these accidents occasioned 121 deaths, and in 1881, another claimed sixty-eight victims. In spite of this fact, however, we learn that the number of fatal accidents among the colliers, was 2·70 per 1,000, while among the workmen and other employees of the railways, the proportion was 3·56 per 1,000. From these figures, it appears that a collier is exposed to considerable less risk than a railway servant. This fact will come as a surprise to many who have been taught to regard the occupation of the miner as peculiarly dangerous. It shows that the precautions taken in the colliery are efficacious, and should be sufficient to silence those ill-informed persons who, whenever a colliery accident occurs, are ready to cry out against the management and to suggest more restrictions.

A New Amalgamator.

James M. Dyer of San Francisco has patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, an improved amalgamator, the patent of which has been purchased by the Globe Iron Works of this city. The machine is capable of separating the valuable heavy portions of ore, concentrating these heavier particles, and amalgamating those portions which are capable of amalgamation.

The pulp is delivered in a hopper, from the lower part of which it passes into a space between two amalgamated copper plates. These plates extend the whole length of the table, the first portion of which may be nearly or quite horizontal. The lower plate may be secured to the table, and the upper one is separated from it far enough to allow the pulp to pass between them. The second portion of the table inclines upwardly at a greater angle than the first part, and the lower portions of the amalgamated plates continues along its surface to its upper discharge end. This bottom is secured between sides, and the whole is securely fastened together with transverse timbers.

A box is placed above the upper end of the incline portion of the table, and having a water-supply pipe, the box being so arranged as to discharge clean water upon the table, or as to flow down the incline and assist in separating and cleansing the sulphurets and other heavy material.

It will be manifest that the desired action of the table might be produced by giving it a sudden backward movement just at the end of the forward stroke, which, with the inclined hangers, produces a sort of forward tossing motion. The movement may be effected by any well-known mechanism for giving a variable speed.

The box or table, thus formed, is suspended from some point above by hangers or rods, which have their upper ends pivoted, and their lower ends pivoted to the sides of the table, so that these rods will stand at a considerable angle with the horizontal or vertical line. This angle may be changed as desired.

A cam upon a shaft acts on the table so as to reciprocate it in such a manner that the table swings upward and forward with a quick motion until it strikes against suitable humpers. This action causes the pulp to move along between the two amalgamated plates, and the concentration begins at this point, the heavier portion settling on the lower plate, while the lighter portions pass along near the upper one until they reach openings in the sides of the table, through which they escape into the discharge sluice box and escape. The heavier material—sulphurets, amalgam, etc.—after leaving the space between the upper plates, is forced up the inclined portion of the table by the constant succession of shocks, and from the peculiar manner of hanging the table. These shocks are given in an upward and forward direction, and this causes the concentrated material to move rapidly up the incline to the point where it is discharged.

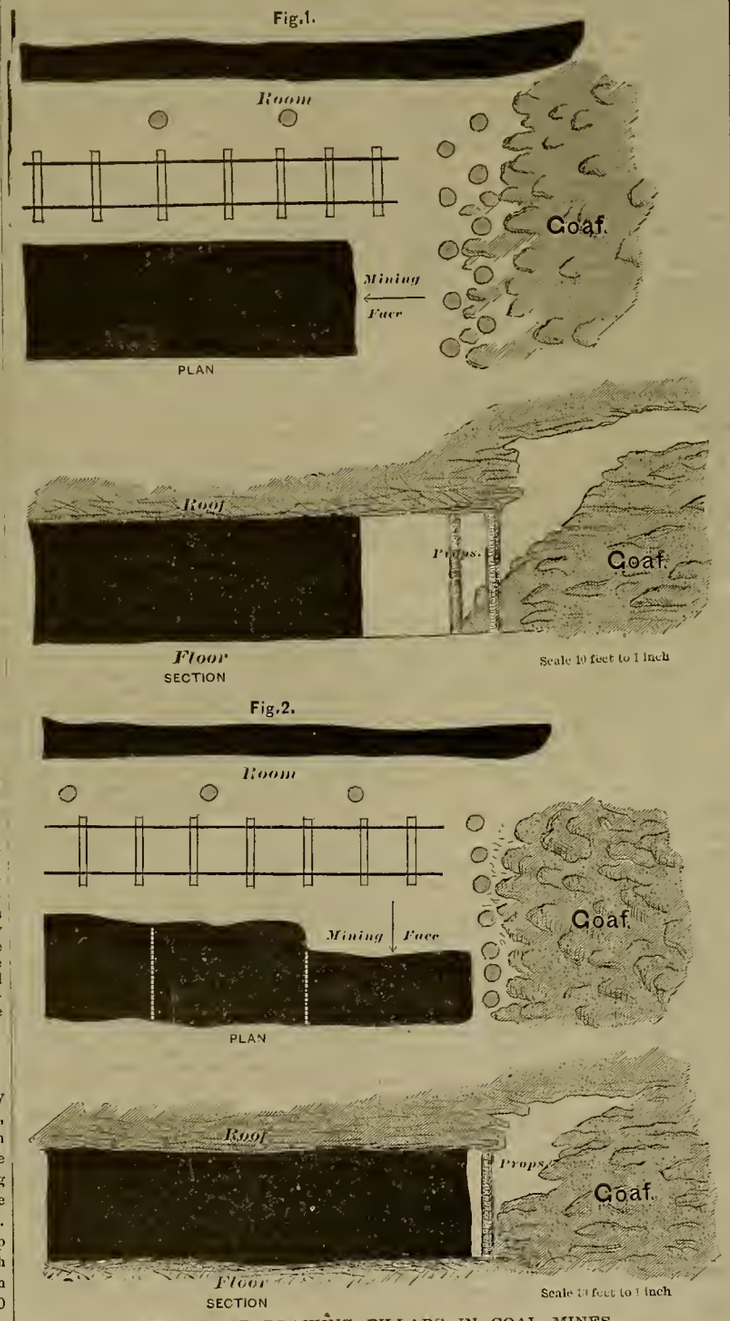
Curious Boiler Explosion.

A boiler explosion with fatal results lately occurred in Eufaula, Alabama. Two boilers, each 50 inches diameter and 22 feet long, with 14 six-inch diameter flues, had been in use about one month, furnishing steam for working a cotton compress, when one day one of these exploded, killing 8 men and wounding several. At the time of the explosion a man was on top of the boilers engaged in covering them with asbestos. He, with the top of the boiler on which he was standing was blown about 900 feet. The boilers were new and made of homogeneous steel, of 55,000 pounds tensile strength, the shell being ¼ inch thick and the heads ⅜ inch. The boilers were riveted by machine, and the rivets showed a fin between the two sheets at the seam; this fin being caused by the shaving down of the rivet in the upsetting. This fin separated the sheets so that excessive calking was necessary to make the seams tight, and even this did not avail, as was shown in similar boilers taken out from a compress at Columbus, Georgia, after this explosion, and replaced by others of a different thickness of steel and greater tensile strength.

It would seem from this that unless the two edges of the sheets forming the seam are brought solidly together by the upsetting of the rivet, that the strength of the seam is but of little value, no matter how well the rivet may be headed or how well it fills the hole in the sheet. Too much care cannot be taken in the construction and inspection of boilers when building and when being worked.

Drawing Pillars in Coal Mines.

In last week's PRESS was given a description of the old and new methods of coal mining in the Connellsville coke region of Pennsylvania. Some further facts concerning the methods of drawing coal pillars will be of interest. There are now two general methods in use in this kind of work. The first consists in hewing the coal on the face of the pillar (See Fig. 1) the miners being protected by a double row of props, which arrests it falling off the roof, and also prevents the talus of falls of roof from encumbering the mining face. As the mining advances, the line of props next to the roof is moved to the front rank, and this work of alternating the two lines of props is continued until the pillar has been withdrawn. The props of each line are placed two or three feet apart, and the two lines are about three feet apart. This double set of protecting props is extended a sufficient distance across the room-working to prevent the roof from coming down so far in advance of the line of mining-face of the pillar-working, as to encumber the loading of coal in cars near the end of the track.



METHOD OF DRAWING PILLARS IN COAL MINES.

The second method consists in protecting the miners by a single row of props placed six inches to one foot apart, near the working-face of the coal-pillar (see Fig. 2). This not only arrests the breaking down of the roof in its usual plates and blocks, but holds back the talus of these from interrupting any of the mining operations. Under this system the miners attack the coal-pillar on the flank instead of the end, removing it in sections of from five to eight feet in length. When each section has been removed, and the track has been lifted, these fender-props are moved to a new line close to the coal-face or end of pillar. The superior safety of this plan is apparent. The props hold the roof steadily at one fixed line until the section of pillar in advance of it has been removed.

In both these operations, involving the breaking down of the roof, it has been found expedient to require the miners to use safety-lamps to guard against explosions from sudden outgushes of fire-damp from the breaking roof. The character of the roof-slates in the Connellsville field is such as to assure the easy execution of this method, and involve no additional danger to the miners. No accident has yet occurred in drawing pillars in the large mines of the Cambria Iron Company.

The same system of removing coal-pillars between the rooms in a mine can readily be applied, at the proper time, to the withdrawing the coal-pillars alongside the levels or main headings, the butt-headings, or other ways of the mine.

As the safety and economy of this system of exhaustive mining have been fully established during the past two years, it is to be hoped that all mining in coal will in the future participate in the benefits arising from this system of drawing of coal-pillars, and its related economies.

THERE is deep snow on the Ojai hills in Ventura county, not far from the ocean, a very unusual sight.

Life of Ropes in Mines.

A paper was read a short time since by Mr. Hort Huxham, before the South Wales Institute of Engineers, on the subject of "Endless Rope Haulage, as adopted at the Clifton Colliery, Nottingham," which gave rise to considerable discussion, during which some interesting facts were elicited. The author wished to mention, after reading his paper, and before discussion upon it commenced, that in view of the objection that might probably be taken in regard to the statement of cost being based on the estimated life of the haulage rope of eight years, as compared with the much shorter period of twelve, eighteen, or even twenty-four months, common in the South Wales collieries, he had recently written to ascertain the effect of the additional twelve months' wear on the ropes, since his visit to the Clifton Colliery in November, 1883, and in reply, Mr. Henry Fisher, the manager—who was well known as one of the most practical colliery engineers in the Midland district—stated that one of the ropes, 4,000 yards long, had been in full work for the past five years, and he could not see any material difference in its condition during the past twelve months, although it had been hauling much larger quantities of coals during that time. He had had a short piece of the rope cut out, and judging from the condition of the wires and small amount of wear to be seen, he was more satisfied than ever that the rope would wear at least three years longer, making the "life" of the rope at least eight years. Another rope had been on for two years and seven months, and appeared to be little different from the condition it was in when put on new. Mr. (Mr. Huxham) considered this information to have an important bearing on the question of endless rope haulage, and he thought conclusively proved that eight years was not an exaggerated estimate of the "life" of the ropes, under this system of haulage and conditions similar to those obtaining at the Clifton collieries.

The President said it seemed to him that the reason for the long life of that rope was found in its thickness, and in the way that the trams were attached. At the Reservoir incline at Tredegar they had a rope which had been working between four and five years. He had caused it to be examined two or three days before, and was told that it would last at least another four years. It turned out to be practically about the same size as the one that was used at the Clifton Colliery, and the trams were attached to the ropes with chains. They found that the thickness of the rope had a great deal to do with its "life," and that in the case of the small ropes they did not get anything like the proper duty out of them.

Mr. W. D. Wight said he was of opinion that a little too much had been made in the paper of the "life" of the rope and the system of working it, and too little of the make of the rope. He believed that a very great deal of the result attained at the Clifton Colliery had been due to the particular make of the rope, which his experience led him to believe was incomparably superior for haulage purposes, and that it might safely be expected to last a very considerable time longer than any other rope that had yet been introduced.

THE Trustees of the Pyramid Mining Company have decided to shut down the mine. Their furnace was built on the right principle, they think, but not exactly after the proper model. It leaves big bunches of ore in the corners that are not reached by the heat, and there are other objections to the shape of it. A new one will be built next spring and the mine opened up for dividends.

THE Plymouth Consolidated Mining Company of Amador county, Cal., paid its nineteenth consecutive monthly dividend of $50,000 on the 5th at New York. This mine has paid $950,000 in the past nineteen months, which is probably a larger sum than has been paid by any other claim in this State during the same interval. Alvinza Hayward, of this city is a prominent owner in the Plymouth Consolidated.

THE Small Hopes Mining Company paid two dividends last month, and also one on the 6th December. The last makes a total of $800,000 this year. The mine is at Leadville, Colorado, and is just now the most attractive in all that camp, on account of its magnificent yield of late.

Some Mines of White Pine, Ward, Taylor, Osceola and Cherry Creek Districts.

[From our Traveling Correspondent.]

The Martin White, at Ward, is working a small force at present, making further developments and getting ready to take out ore. Mr. W. B. Clement, in charge of the property, stated that the outlook for a good long run of the mill next spring is satisfactory.

Taylor Mining District

Is located on the western slope of the Shellbourne range of mountains, 100 miles from Eureka, in an easterly direction, at an altitude of 8,000 feet above the level of the sea, and 500 above Steptoe valley.

The formation is quartzite and limestone, intersected with seams or dykes of porphyry, the whole resting on a base of granite. Near the center of the district are located the Monitor and Gore mining claims, owned by Messrs. Robert Briggs, W. G. Lyons and W. N. McGill, operating under the firm name of

The Monitor Mill and Mining Co.

It is not incorporated. The greatest depth attained in the mine is 150 feet. On the surface, the ore occurs in massive croppings 1,000 feet in length and 300 in width, rising in places from 10 to 15 feet above the surface. They consist of a dark-brown quartz, very hard, and carry a free chloride of silver to the value of from $20 to $30 per ton. Underneath these immense croppings are found large chambers of rich chloride and horn silver ore, much softer than the lower grade, worth from $100 to $1,500 per ton. These chambers are usually from 80 to 150 feet in length by 30 to 50 in width, lying nearly flat, and from 6 to 15 feet in thickness. The foot-wall is quartzite overlaid with a dyke of porphyry from 3 to 6 feet thick. The ore is free-milling, and by the amalgamating process, works up to 80 or 85 per cent of the fire assay, producing bullion from 870 to 900 fine. It is reduced at the company's 10-stamp mill, 8 miles from the mine, the improved "Knight" water-wheel being in use. (Right here a little digression may be pardoned. Hon. Robert Briggs, State Senator elect from White Pine county, and one of the proprietors of the mill and mine, says he has been indebted to the MINING AND SCIENTIFIC PRESS for information in regard to the above named wheel and for other important facts and hints which, he values at not less than $1,000. "Tell it not in Gath, publish it not in the streets of Ascalon," lest some other miner subscribe to your paper and become as rich as the lucky senator.) The mill crushes on an average about 13 tons of ore in 24 hours. From the 1st of Sept., 1881, to the 14th of July, 1884, with a total run of less than 20 months, it produced $369,261 in silver bullion and has been steadily yielding since that date from $600 to $1,000 per day.

The owners deserve much credit for pluck and perseverance. They commenced with very little capital. By economy and a strict attention to business, the mine has been made to pay all expenses for opening, for the erection of a good substantial mill and other improvements, besides giving several handsome dividends in hard cash. In addition to the rich ore extracted daily, it is thought that the large deposits of low-grade ore found in the croppings alluded to, can be made to yield a fair profit with proper facilities for working.

To this end a 60-stamp mill will, in all probability, be erected in a short time on the ground.

The Argus Mining Company

Have three claims on the same lead, of 4,500 feet in length—running parallel with the Monitor, and somewhat higher on the mountain side. The ore chambers lie in a similar shape and position; the rock in character much alike, that of the Argus Company being represented as some freer as a milling ore. Only one class is worked at their mill of 15 stamps, yielding from $50 to $60 per ton. The principal work is being done on the Sunrise and Self-Cocker. The mine is said to be looking better than at any time since work commenced, some 18 months ago.

The Hayes, immediately south of the Monitor, has ore of the same grade and character, a number of tons tested at Salt Lake giving excellent results.

The June mine, west of the Hayes, had just shipped 50 tons to the Argus mill. Some first-class, previously worked at the Monitor went upwards of $300 to the ton.

The Purser, north of the Monitor, owned by Messrs. Peck & Hixson, is a good prospect, giving assays all the way from $60 to $700 per ton.

The Breechloader.

On Chloride mountain, one and a half miles north of the town of Taylor—the property of Mr. J. W. Hixson—is in a lime formation with quartzite and shale on the east. A 40-foot shaft shows an ore vein 17 feet wide, the gangue carrying the ore consisting of spar, quartz and silicious lime. A few tons reduced yielded $250 per ton, the lowest $102, and the highest $1,057 in silver, and about $8 in gold. The same kind of rock crops out the whole length of the claim.

From the statements just made it must be evident that Taylor is one of the most flourishing districts in Eastern Nevada, giving promise of a long and prosperous future.

Osceola Gold Quartz and Gravel Company,

Is situated 20 miles east of Taylor, at no great distance from the Utah line. Over $250,000 in gold have been taken out in a small way by pan and rocker from her gravel beds, which are reported to have produced the largest nuggets of any camp in the United States. Some of them being worth from $2,000 to $5,000 apiece.

The Osceola Gravel Mining Co. is a Utah incorporation owned principally by Messrs. Hampton, Godbe & Bigelow. They became interested in the placers of this district in 1877, and through their agent, Xavier St. Pierre, obtained by purchase and location over 700 acres of placer ground, nearly 500 of which are patented.

These gentlemen are the pioneers of mining and smelting in Utah, where their interests give constant employment to large forces.

They are now constructing a canal some 16 miles long to convey the waters of five creeks to their placer grounds. The aggregate quantity of water furnished will be 1000 miners' inches.

Engineers Smith and Doremus, late of the Union Pacific Survey, have charge of the construction, and Mr. Black, of Deseret, and Judge Grover, of Nephi, Utah, are the contractors for its execution, the completion of which is to be by the 1st of June, 1885.

The company made an exhaustive examination last season of their deep bars, which showed them to contain gravel varying in value from 45 cents $1.25 per cubic yard. This test is confirmatory of many hundreds that have been made in years past by shaft and tunnel explorations. The unusual snows of last season furnished the means of using a small hydraulic, by which they washed from various places over 10,000 cubic yards of gravel.

Osceola Quartz Mines.

The gold-bearing quartz belt is twelve miles long and seven wide. The district is a network of quartz veins, many of them excelling in richness the famous gold ore bodies of California.

The Cumberland, one of the pioneer claims, is a strong six-foot vein, owned by Messrs. Richardson and Delmater, and has a shaft 100 feet down. Forty tons of ore from this mine gave a result of $40 per ton.

The Osceola, owned by the same parties, has a shaft on the ore body 130 feet. About 60 tons worked from this mine yielded $37 per ton. The vein is three feet wide, and pitches south at an angle of 70 degrees.

The Crescent and Eagle mines, now owned by Messrs. Gilmer and Chandler, have workings to a depth of 300 feet. Several thousand tons of ore have been reduced from these mines. The books of the company show a result of $11 per ton.

The Saturday Night is a four-foot vein, has no deep workings. Twenty-six tons of ore worked last fall yielded $80 per ton.

The Verde mine, owned by Messrs. Akey and Felsen, has yielded $34 per ton from a sample of 37 tons.

The Stem Winder, owned by Messrs. Chas. Bussey and L. S. Scott, a large well-defined vein, is rich in the precious metals. No ore has been worked from this mine, but an examination of the vein by an experienced miner will place it amongst the best.

The Guilded Age, owned by Philips, Watson and others, has yielded over $40 per ton mill process.

The Grandfather Snide, owned by Jake Henderson, is a little bonanza. Ore from this mine yielded as high as $3 per pound.

The Red Monster, owned by Pat Revey, has a shaft 100 feet. From this mine the owner washed out with a rocker after screening the ore, $600 in less than 30 days, securing at the rate of $9 per ton, and leaving about $20 in the quartz.

The Saturday Night, owned by Mr. B. Tilford, has a drift of 50 feet, and has turned out 75 tons of ore, 25 of which assorted, yielded $82 per ton mill process.

The Royal Flush,

A late discovery, bids fair to eclipse the best. Samples worked by mortar and pan show results as high as $2,000. This is a small vein owned by Messrs. Akey and Delmater. These mines are nearly all contact veins in quartzite and slate, with a dip always to the south and the general course is northeast to southwest.

A number of other mines of value might be mentioned. It is capital that is wanted in this district. Of wood and water there is an abundance, with the finest climate in the world.

Mines Around Aurum.

Dr. L. B. Brooks is agent and co-owner with a Boston syndicate of a group of mines situated in Silver Canyon, seven of which are patented mines of great promise. The principal ones are the Sadie L. and the Blue Bell. The former is opened by two tunnels and incline shaft to the depth of 500 feet, and has developed a small ledge of marvelous richness. The Blue Bell has reached a depth of 400 feet by shaft and tunnel. A winze of 200 feet will be sunk on the ledge from the tunnel level. The vein is a contact between lime and shale. A large deposit of rich ore has been stoped out the past year along the line of the tunnel level. From the Blue Bell mine there is a trackway around the side of the mountain to a tramway leading down to the ore house at the mill, where all the ore handled by the company will be reduced.

The mill is a ten-stamp, intended for wet-crushing, with all the modern improvements, put up by Rankin, Brayton & Co., of your city.

Dr. Brooks has recently bonded a series of mines in Ruby Hill District, five miles south of Aurum, or Silver Canyon, where the mill is located. The mines consist of the following claims: The Silver Wreath, the Cow and Calf, Lookout, Grizzly and the Iowa Chief. This district has produced, since its location in 1872, over $100,000 in surface workings, the Silver Wreath yielding in a few months $25,000. The Grizzly is the old Rattler's Joy ground, from which $10,000 were taken out in a few weeks, so that the present prospect may be looked upon as more than usually bright.

The Aurum mine, owned by S. Davis and Geo. Palmerton in Silver Canyon District, is a true fissure in quartzite, as shown by the developments and the croppings along the full length of the claim. It may be considered a fine prospect for the depth—some 20 feet. Assays run from 11 ozs. in silver as high as 267 ozs. A shipment of 690 tons of ore as a test worked at the rate of $300 per ton.

Shelbourne District.

The old Woodburn, now known as the Northern Light, the property of Messrs. Gilbert and Martin, has a shaft 50 feet, and a cut following the ledge 75 feet. It appears to be well defined, with clay seams on each wall. The last ore worked: First class, as high as $200 per ton; second class, $96. Some of it closely assorted, previously went at the rate of $800.

Some surface rock, assorted, from the Summit mine, a patented claim in the same range, yielded $200 per ton.

The Eagle Mining District,

Situated 15 miles east of Shelbourne, has a perfect net-work of well-defined veins in granite.

Work is being done on the Wheal Anna. It shows a width of 4 feet. The ore will work up to $200—assays going up as high as $600.

A late discovery has been made here in lime, in near proximity to the granite, which is one of the prettiest prospects from all accounts, recently found. It is a sulphuret ore that requires roasting, estimated to work from $300 to $400 to the ton—the quartz being as lively and beautiful as one could wish to see. Instead of reducing it in a small two-stamp battery and a Frue concentrator, it will hereafter be shipped to Salt Lake.

Mines of Cherry Creek.

In view of its past prosperity and the acknowledged extent and richness of the district, the camp was found to be exceedingly dull. No time can be given to recount the causes.

The difficulties in the way of renewed life are by no means insurmountable, and a revival of business might take place almost any day.

There are here what is known as the upper and lower belts—the latter three miles in length.

The upper ledge is a contact vein between lime and shale, traceable for five miles. The principal mines on this are the Ti-Cup, Bob Tail, Rob Roy and the Chance. South of the Ti-Cup are the Bohemian Girl, the Blacksmith, Steptoe and others. The ore is free milling, and much of it has run from $60 as high as $600 and $700 per ton, and worked up to 90 and 95 per cent. The Ti-Cup has paid in the neighborhood of $1,000,000. The Rob Roy, worked at present by Messrs. Taylor, Curtis & Stoble, is said to produce ore worth from $80 to $100.

The Lower Belt

Consists of a series of true fissure veins, cutting the formation from east to west. The ore as a rule is refractory, needing roasting.

The most promising mine is the Star, that has turned out $1,500,000, although not now worked. Next may be named the Exchequer, the Big Giant, the Grey Eagle, Chief of the Hill and west extension of the Star, all in one group.

On Flagstaff Hill, two miles south, are the Pacific, Mary Ann, the Flagstaff, Little Maud and others.

Many of these have yielded large amounts of bullion, the Exchequer sometimes smelting near a million.

It is now owned by Mr. J. B. Williamson. It comprises three parallel veins with 80 feet of porphyry between the east and middle ledges—the west vein being very narrow with ore of very high grade. It mills from $200 to $500 per ton. Within one-half mile north, the old Imperial is turning out ore of the same grade, averaging about $230 per ton.

THE Salt Lake *Tribune* says: In some of the mining camps of Utah the miners have been receiving $3.50 per day, while in others the wages has been but $3. At the Cave and Carbonate mines, owned by Godbe & Co., near Frisco, the men have been paid $3.50 up to the close of last month, when it was the design of the employers to make a cut of 50 cents, beginning December 1st. At the Cave the company was employing about 45 men and the Carbonate 38. But in consequence of the serious decline in the price of lead, Godbe & Co. felt compelled to make this reduction of 50 cents.

A PLANT of machinery, for the manufacture of sugar, has arrived in Yokobama, and will be immediately forwarded to the Hokkaido, where it will be erected and worked under the superintendence of German employees of the Department of Agriculture and Commerce.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

APPARATUS FOR CONCENTRATING ORES.—Otto Hansen, Sacramento. No. 308,410. Dated Nov. 25, 1884. This apparatus includes an inclined vessel having a series of downwardly tapering successive chambers or compartments, increasing in capacity and communicating with each other; a water pipe adapted to discharge within said compartments, and peculiar screen vessels under the discharge of each compartment to receive the concentrations and size them. The apparatus is adapted for crushed ore, tailings, earth, sand, etc.

FIRE KINDLER.—B. W. Connelly, S. F., No. 308,140. Dated Nov. 18, 1884. This fire kindler consists of sawdust as a base, previously prepared with a solution of saltpeter and alum, and subsequently mixed with resin, tallow and tar, and moulded in a peculiar shape. The object is to provide a fire-kindler in which the natural inflammableness of the resin, tallow and tar is held in check to a certain extent by the chemically prepared sawdust, whereby rapid combination is retarded, while a high degree of heat is engendered, and by the peculiar shape into which the composition is moulded, to provide for ventilation to prevent it from being smothered by carelessly placing the fuel upon it.

SPUR.—Johan Kaino, Cuffey's Cove, Mendocino Co., No. 308,413. Dated Nov. 25, 1884. This spur is of that class in which a suitable holding-dog is adapted to engage with the heel of the boot for the purpose of retaining the spur in place; and the invention consists in connection with the spur, of a peculiar spring-dog adapted to engage with the back of the heel of the boot, when the spur it raised to encircle the counter, and in a peculiar bearing adapted to be driven into the heel with which the spring-dog is adapted to engage in cases where it is not desirable to effect the engagement of the dog directly with the heel. The object of the invention is to provide a spur which may be easily adjusted in place and removed with facility.

STAIRS.—Peter H. Jackson, S. F. No. 307,551. Dated Nov. 4, 1884. This invention relates to certain improvements in stairs which are used in buildings, either plain or with openings for glass for illuminating. It consists of risers so constructed as to form deep vertical beams supported at the ends only, with treads extending from the top of one to the foot of the next, and an improved means for securing the two together; the formation of the nosing for the edge of each tread, with a concave space at the rear, into which Portland cement or other material may be pressed in the plastic state, so as to form a tight joint; a means for securing the nosing to the riser, and also for uniting it with the foot of the next one; with means for securing the cement or other material for the tread, together with certain details of construction.

PIANO ACTION.—John Rudolf, S. F. No. 308,201. Dated Nov. 18, 1884. This improvement in piano actions consists in a combination of devices. In the ordinary combination of piano action, the key-lever actuates a second shorter lever, which has a tripping arm attached to it, and this engages the block into which the handle or arm of the hammer is fixed, so as to throw the hammer forward against the string, from which it is retracted by a spring after being released from the tripping lever, and a pad or buffer supported by a second arm, which projects from the lever before mentioned, receives it as it falls back and prevents vibration. In Mr. Rudolf's piano action there is a key-lever, a hinged swinging hammer, and a rod or stem connecting the butt of the hammer shank directly with the key-lever without the intervention of a jack or fly lever and fly, and an adjustable key-stop, in combination with an arm, peculiarly arranged with relation to the stem, and an adjustable stop.

OAT-MEAL MACHINE.—Alfred Swingle, S. F. No. 307,882. Dated Nov. 11, 1884. This machine for cutting oats and grain comprises a cylinder revolving on a hollow horizontal shaft, through which the grain is fed into the cylinder; a series of knives or cutters arranged at intervals around the circumference of the cylinder, at a short distance therefrom, with a casing or shield extending from one knife or cutter to the other, and having openings through which the cut material may be discharged. The circumference of the cylinder is perforated with holes of sufficient size to allow the oats or other grain to fall into them endwise, and be carried around, with their ends in contact with the surrounding casing, until they arrive at the edges of the knives, where the projecting portions will be cut off and discharged. This action continues until the oats are all cut up. Below the cylinder is a spiral conveyor, which delivers the cut material into the inclined cylinder, where the flour and the first and second sizes of the grain may be separated. At the exterior of the cylinder is a smaller cylinder, having projecting pins, which are so placed as to enter the holes in the periphery in the main cylinder as it revolves, and thus press out any particles of oats which may become fixed in the holes.

ENGINEERING NOTES.

Engineering Information.

A cotemporary, the *Engineering Journal*, of New York, hears much complaint on the part of consulting engineers that much of their time is occupied by visitors who ask innumerahlo questions of n strictly professional character, and bearing directly upon the financial successes of the enterprises that they have entered into. "It never appears to enter the minds of these people who try to pick the brains of consulting engineers that the time of the latter is money to them, as it is to any other business or professional man. No one would dream of entering a lawyer's or a physician's office without being prepared to pay for the advice or the opinion given him, and yet the same persons will think nothing of talking by the hour on their wonderful property, detail their woes and troubles in connection with it, and ask to be instructed as to the best means of putting their enterprise on a sound basis. At the end of the interview they are profuse in their thanks, and smilingly bow their way out. Our mining engineers have been wonderfully good natured with this class of clients, and have thereby, we are convinced, only aggravated the evil. It lies largely with them to stop it by simply following the practice of other professional men."

NEW ENGINEERING SCHEMES IN THE OLD WORLD.—Two gigantic engineering schemes force themselves upon public attention this morning, says the *Pall Mall Gazette* for July 5th. One is the proposal to pierce a railway tunnel through the Pyrenees, the convention for which has just been signed by the French and Spanish International Railway Commission. The other scheme is for the formation of a company to construct an international railway connecting Europe with Persia, India, Burmah and China. It appears that Sir R. M. Stephenson, who has been endeavoring to arrange with the Soblime Porte for the commencement of the works in Turkey for the last 34 years, considers that the negotiations are so far advanced as to warrant the formation of a company to work the concession, which he believes he will eventually obtain. He proposes to raise, for making the Asia Minor and Persia sections, a capital of $80,000,000, in 600,000 shares of $100 each, of which it is proposed $20,000,000 shall be saved by troops' labor, leaving $60,000,000 to be subscribed.

TO TEST THE VIBRATION OF BRIDGES.—The *Ohio State Journal* says that Mr. Fred Marvin, a graduate of the Ohio State University, has just completed, under the direction of Prof. Robinson, an instrument for testing the lateral and vertical vibratioos of bridges while trains are passing over them. The "indicator" consists of a cylinder run hy clock-work, a strip of white paper wrapped nround the cylinder, and two pencils whose points touch the paper as the cylinder moves. The machine is fastened to a hoard 20 inches long by a foot wide, which is clamped to a beam. When there is no train on the bridge the pencils register straight lines as the cylinder moves; but as soon as a train strikes the hridge, the vibrations, both longitudinal and transverse, are recorded. It is proposed hy this machine to determine the safety rate of travel over a bridge, both for loug and short and heavy and light trains.

A BRIDGE OR TUNNEL.—For some time past the Italian Government has been considering the project of a tunnel under the straits of Messina, to connect Sicily with Italy. A Piedmontese company has come forward with a counter project for a bridge, which if ever carried out would form as remarkable a work of the kind as there is in the world. The width of the strait at its narrowest point is ahout two miles; bnt owing to the great depth of the water—more than 500 feet—on this line, the projectors propose to locate the bridge where it would have a length of ahout two miles and a-half. The plan involves four piers, connected hy spans of five-eighths of a mile in length, the two shore arches having half the span of the three central ones.

ANOTHER COLOSSAL RUSSIAN RAILROAD PROJECT.—The St. Petersburg correspondent of the London *Times* writes that "the German and Russian newspapers refer to another gigantic railway scheme believed to be entertained by the Russian Government, to wit: a great Pacific railway running from Ekaterinhurg, through Toboisk, Yeniseisk and Irkutsk, to Nikolaievsk, on the Amoor, with one branch to Irtkutsk and Kiakhta, another to Herat and India, and a third to Bokhara and Kashgar. This wonderful scheme is to have 21,000 versts of road, and to cost—we must presume, when the Imperial finances have improved—one millard of roubles, or 50,000,000 roobles per year for twenty years."

TUNNELING THE SPLUGEN.—It is now proposed to make a tunnel and railway through the Splugen. The project is regarded with great favor hy those interested in Lombardian railways, and support is looked for from Bavaria, Wurtemberg, and other parts of Germany. The estimated cost of the whole work is about $16,200,000.

USEFUL INFORMATION.

Preservation of Coal From Cruumbling.

Freshly mined coal is capable of condensing several times its volume of oxygen in its pores. The oxygen absorbed enters into chemical combination with tbo easily oxidised constituents. According as the absorption is rapid or slow, a greater or less elevation of temperature is produced. In the former it may lead to spontaneous combustion. The crumbling of coal is, among other causes, a consequence of the absorption and condensation of oxygen in its pores nnd chemical changes taking placo. The escape of the hygroscopic moisture favors the absorption of oxygen. The pyrites can only produce a promoting effect on the increase of temperature when present in considerable quantities, and then only in the presence of moisture and air. In the dry state they must be regarded as perfectly passivo, and may even be detrimental to the warming. Freshly mined coal, therefore, according to a writer in *Van Nostrand's Magazine*, placed in an atmosphere of steam can suffer no change. Even with incomplete exclusion of the sir, it will be found that the steam will, in general, oppose oxidation and warming, principally by uniform moistening of the pieces of coal.

CAUSE OF DECAY OF WOOD.—Professor P. H. Dudley, well known to railway and scientific men in connection with his di coveries made by aid of the dynagraph tar of his own invention, has been for some time investigating the cause of the rapid decay of wood. His methods of investigation have been mostly microscopic and chemical. Some time ago he discovered the fungi that caused the premature decay of most of the woods used in railroad structures, and followed their operations on the secular structure of the wood. By use of the photomicrograph views, he kept a graphic record of the appearance of decaying wood tissue. After patient search Mr. Dudley has discovered the spore that acts as the seed of fungus, and he expects soon to provide a means of destroying this seed before it produces growth. Some of the wood-preserving methods in use do not destroy the fungus spores, aod they go on germinating their ruin-making fruit. Any sure means of arresting the premature decay of wood will prove exceedingly valuable to railroad companies, since bridges and ties often fail with half their natural age, and in failing often bring abont disastrous consequences.

IMPURITIES IN MILK.—At a recent lecture delivered in London on "Bad Food and its Detection," it was stated that the lactometer is useless, and plays into the hands rather of the fraudulent dairyman than of the consumer. Fat being lighter than water, a rich milk might appear watered by this test, and tricks of the milk trade might thus be fostered by its use. The importsnce of purity in milk could not be over-estimated, but the only method known by which it could be satisfactorily tested was complete analysis. The testing of butter was also somewhat complicated. A simple yet infallible test for alum in flour was shown. On a portion of adulterated flonr being placed in a small quantity of chloroform the flour floats, while the alum or other mineral matter sioks to the bottom. In a similar way alum in bread may be instantly detected by placing a small piece of the suspected loaf in a solution of logwood and carbonate of ammonia; if alum be present, the bread will turn blue.

A REVOLUTION IN ROLLER SKATING.—Geo. P. Clark, of Windsor Locks, Conn., the well-known manufacturer of rubber truck wheels, is now in the market with a new patent rubber wheel for roller skates, which has met with most substantial success, and bids fair to revolutionize the popular amusement of roller skating. There has long been a demand for a rubber wheel for this purpose, but although much study has been given to the subject, and many methods have been tried, they have hitherto signally failed. Mr. Clark, however, seems to have surmounted the difficulties which stood in the wny of a practical rubber wheel for skating. By his methods it is simply impossible for the rubber to slip or stretch off, as was the case with the old methods, and the sides being made of that strongest and most enduring material, steel, nre yet constructed in such a scientific manner as to render them comparatively light.

THE PANTALOONS BUCKLE.—"That buckle at the back of your and everybody's else pantaloons," said a prominent tailor of Williamsport the other day, "is about as senseless an institution as exists. Do you know its origin?" The reporter admitted his ignorance. "Well," said the clothing man, "that buckle used to be on trousers before suspenders came into use, and was employed for the same purpose. It ought, of course, to have been discarded when the suspenders came in, but, through some strange freak, the men who made clothes then continued to use the buckle, and the tailors after them, as well, so here we are to-day putting wholly unnecessary work and bother into clothes. The thing is of no more use than two tails to a dog. Singular, isn't it?" And the reporter went on his way pondering.—*Breakfast Table.*

A LONG PIPE-LINE.—The producers of petroleum on the western shore of the Caspian sea, it is said, have been seriously contemplating laying a pipe-line entirely across Persia to the Persian Gulf. If this were done, they claim that they would have the Asiatic market to themselves. This pipe-line would have to be something more than 700 miles long to reach the coast; and as it would for a long distance pass through a territory of savage Kurds, and other nomadic tribes, it is feared that it could not be easily kept in operation.

EXPORTING STEEL RAILS.—According to the *Railway Review*, for the first time in the history of our rail mills they have made a large sale of steel rails abroad. The Lackawanna Iron nnd Coal Compsny has contracts to delver 10,000 tons of steel rails at Brockville, Canada, for the Cnnadian Pacific at a figure varying not far from $28.50 per ton. It is not so very long ago that we were importing steel rails to a not inconsiderable extent, and our ability to now turn about and compete soccessfully with the mills from which we have so recently bought indicates the existence of possibilities in an export trade in steel rails that should not be lost sight of.

GAS-TIGHT TUBING.—The *London Engineer* says: Thomas Fletcher has made gas-tight elastic rubber tubing. The tubing is made of two layers of rubber with pure soft tin foil vulcanized between. It is said to be perfectly and permanently gas-tight, and free from smell nnder all circumstances, whilst it retains sufficiently for all purposes the flexibility and elasticity of an ordinary rubber tube.

THE PAPER BOTTLES now made in Paris are made up out of sheets of paper somewhat after the fashion of rocket cases, but the cementing material is a mixture of blood-albumen, lime and alum. Neither water, wine nor alcohol has any action on such bottles, and it is expected that they will prove of great value to travelers, as there is but little fear of breakage.

IN BEES THE CROP is called the honey-bag. The gizzard is found in insects having mandibles, and is frequently lined with rows of horny teeth, which are especially developed in grasshoppers, crickets and locusts. Insects have no true liver, but its functioos are performed by little cell masses on the inside of the stomach.

SOLDERING CAST IRON.—In soldering cast iron with soft solder much difficulty is experienced by the solder refusing to adhere to the surface of the iron, but by using a flux of muriate of zinc, in which a proportion of alcohol, say about half the bulk, has been added, but little difficulty will be experienced.

AN ELECTRIC TRICYCLE.—Experimeuts with an electric tricycle in England have been so encouraging that 250 machines will be huilt. They are driven hy a storage battery, carry two persons and are expected to run at the rate of six miles an hour on level ground.

GOOD HEALTH.

"I've Been Thinking" Series, No. I.

[By JEWELL.]

DEAR PRESS:—I was much pleased to read of Mrs. J. Hilton's experience with carbolic acid. I too can sing praises of its many virtnes and great beuefits to suffering humanity. As a healing agent for burns, scalds, boils, bruises and bites, I know of nothing better for alleviating pain and to promote healing. It is especially good for burns, mixing one part of carbolic acid (98 crystal pure) with ten parts glycerine. For internal use, one to three drops in a tumhler of water is a dose for adults. For vomiting, purging and any sudden stomach trouble, such as infants and children have so frequently, there is nothing hetter. For infants who feed on the bottle, it is an invaluable remedy, simple and effective, when there is gas or acid in the stomach or looseness of bowels. One drop of full strength carbolic acid in half a tumbler of water (to be kept covered), giving a teaspoonful of the mixture every hour or so, will usually be sufficient, and is harmless. I, too, find great relief from its use in aching feet, using glycerine instead of water as a mixture, which is softening to the skiu. It speedily kills corns, if applied as a caustic—strong. For proud flesh, used full strength, it is painless and excellent, destroying the sloughing and diseased parts entirely, if continued long enough; if followed hy burnt alum, the parts soon form granulations and healing begins. It is much used in surgery also—in all dressings of wounds. For felons, carhuncles and such inflammations, a full strength injectiou of carbolic acid into the cavity will usually destroy the disease, and will be found to give immediate relief from pain, and will leave the wound in condition for healthy healiog.

Why cannot the readers of the Home Circle of our much loved RURAL PRESS one and all contribute their mite towards the health column, giving such tried recipes for the relief of the ailments and pains every family are subject to? Surely the experience of the mothers and fathers should be valuable, and might he of lasting benefit to many who are just starting a home nest with its precious darlings.

Many a tearful mother has told me that if she had only known *anything* about the care of babies, her heart would not now be aching, nor her cradle empty. Poor sister! My heart feels for her and all who have passed through the valley of sorrow. I, too, have trod its paths, and my tears mingle with all who weep. If good can come of affliction, let us find it. Death is only unkind to those left. Two bitter lessons have I learned. A deeper, truer sympathy with others who grieve, and a closer and surer bond with the world beyond.

Deer Ridge Farm, Los Gatos.

BUTTER.—Butter is never digested in the stomach, but in the duodenum. This was not known in Graham's time. Digestion does not alter its nature, but only its mechanical conditions, that is, emulsionizes it. The globules of fat are small, so small they can be absorbed. No more interesting sight can be seen than a drop of of fresh milk under a microscope. The fat globules look like little globes swimming about in the fluid. We make them into butter hy setting the milk, when being light, they rise to the surface. Churning still further consolidates them. It is doubtful if they are ever so well emulsionized again, and so digestible as in the milk. The digestion of butter simply converts it back into its original state—a wasteful process, no doubt. If a person eats largely of poor butter, it will most likely cause a bad odor to he excreted from the skin.

THE TREATMENT OF CORPULENCE.—The latest authority on this subject is Dr. Wilhelm Ebstein, whose book concerning it has been translated and published in London. Professor Ebstein's main contention is, that the moderate use of fat, by diminishing the decomposition of the albuminous elements of food, lessens the appetite, and so renders bearable the restriction of diet necessary in the treatment of corpuleuce. He therefore allows in moderatiou such articles as salmou, bacon fat, fat roast pork and muttou, kidney fat, asparagus, spinach, and the various *legumes*; bnt he unconditionally forbids the consumption of sugar, sweets and potatoes, and limits the allowance of bread to from three to three and a half ounces a day.

FIGHTING SLEEP WITH TEA.—The practice of takiog tea or coffee hy studeuts, in order to work at night, is downright madness, especially when preparing for an examioation. More than half the cases of break dowu, loss of memory, fainting, etc., which occur duriug severe examinations, and far more frequeutly than is commonly known, are due to this. I frequently hear of promisiug students who have thus failed; and, on inquiry, have learned, in almost every instance, that the victim has previously drugged himself with tea or coffee. Sleep is the rest of the hrain; to rob the hard-worked brain of its necessary rest is cerebral snicide. —*Popular Science.*

MAN'S LEASE OF LIFE INCREASING.—In the past thirty years, the average of man's life has improved 5 per cent—from 41.9 to 43.9 years; and of woman's life, 8 per cent, from 41.9 to 45.2. Of every thousand males born at the present day, forty-four more will attain the age of thirty-five than used to be the case previous to 1871, and every thousand persons boro since 1870 will live 2,700 years longer than before. This is due to civilization, and especially to improved sanitary methods, which is addiug to the average of human life at the rate of nearly ten years in every century.

PERNICIOUS CASTILE SOAP.—The Edinburgh *Review* has started a crusade against castile soap, saying that there is very little donbt that even the very best brands of white castile soap are made from rancid olive oil, which, being of too poor quality for table use, is used for making soap. The best imported castile soap costs the importers only from ten to twelve cents a pound, all over that paid by the public being profit to the importer and retailer; and pure sweet olive oil brings too much to enable it to be made into castile soap and sold at any such price.

POISON IN THE TOMATO CAN.—Miss Kalver has bronght a suit against Messrs. Thurber & Co., for compensation for injury sustained by her father, caused by eating canned tomatoes put up by this firm. The solder used to secure the can seems to have contained muriate of zinc, a portion of which had fallen into the can. She claims damages to the amount of $50,000. Others who have been injured in a similar way are ready to bring suits if this one is successful, as we hope it may be.

FALLING OUT OF THE HAIR.—This may be caused by dandruff, by age and by various diseases. If hy daudruff, which is more likely, cut the hair rather short and apply vaseline to the scalp daily for six weeks. Do not use friction; but keep the head cool and avoid heavy, hot, unventilated hats. Go bare-headed when you can, even out of doors.

BRAN.—Bran from wheat has no nutritive value unless a portion of the layer of gluteu heneath the bran adheres to it, as is usually the case. Strictly speaking, the bran is only the thin, hard cuticle that covers the berry.

WORKERS IN BLEACHERIES where chlorine is largely used are singularly exempt from all germ diseases, but suffer from special ailments indnced by inhaling that gas.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA

Amador.

PLYMOUTH.—Cor. Amador *Sentinel*, Dec. 13: The mines paid off their hands on Saturday. The Woolford mine has been taken charge of by Hayward and Hobart, and a force of men has been put to work. The hoisting machinery, manufactured by Donnelly & Howard, has arrived on the ground and in a short time it is probable that at least 50 men will be there employed.

OLETA.—Cor Amador *Ledger*, Dec. 8: I hear the marble quarry will soon be in running order. Mr. McAdams has charge of the property again. Mr. Purinton will supply the company with water until the rains set in. Mr. Purinton has about 200 inches of water in his mining ditch which he takes from the south fork of the Cosumnes river. His lower ditch is in good order for the winter also. This ditch gets its supply of water from main Dry creek.

Calaveras.

QUARTZ.—*Mt. Echo*, Dec. 13: J. J. Rapp, sole owner of "Our Flag" mine at Robinnon's Ferry, called at our office the other day. He had in his possession some of the richest specimens of quartz that has ever been exhibited in this town; in fact, it was as rich as it could be and not be solid gold. Mr. Rapp was recently offered $15,000 for his mine. His price is $25,000. Everhart and Gillman have bonded their mine, situated near Peter Miller's ranch, and about one-half mile from Alterville, to a man named Holbrook of San Francisco. The machinery for working the mine has already arrived. This mine has been worked on a small scale by the former proprietors for several years, and has never failed to yield handsomely.

STAR OF THE WEST.—Calaveras *Chronicle*, Dec. 13: We were shown one day this week some samples of ore taken from the Star of the West mine, situated at Skull Flat, two miles above West Point. The rock was taken from a depth of 150 feet, at which point the ledge is one foot in width. The ore shown us was exceedingly rich, being heavily impregnated with sulpburets and also carrying free gold to a considerable extent. The work of prospecting is going steadily on.

El Dorado.

RICH GRAVEL MINE.—*Mountain Democrat*, Dec. 13: Though they make little or no noise about it, the Oak Grove Mining Company (Gregory Bros.) have the finest gravel mine in El Dorado county. It is the finest because it pays best. It is about two and a half miles from Placerville, in a northeasterly direction, and contains 128 acres. In the way of machinery, they have everything that can be used in working such a mine, including a splendid 10-stamp mill. A friend of ours, who has had large experience in quartz and gravel mining during a residence of thirty odd years in the county, visited the mine Tuesday, and assures us that the gravel being taken out is as rich as he has ever seen. On descending the incline shaft, which bas been run something over four hundred ft, he could dig out gold from almost any part of the walls. Another mining man assures us that he washed out a pan of gravel of his own selecting, and the result was one dollar in fine gold. The mill, which is moved by steam, is kept running on gravel that averages three dollars and a half to the car-load.

NO WATER.—For several days the past week water was shut out of the El Dorado Water and Deep Gravel Mining Company's canal, to prevent it freezing. This in turn caused the suspension of work at the Ceday Springs, Alderson and other mills operated by water power, as well as at the Placerville foundry.

THE PYRAMID.—Corrected from S. F. *Bulletin*, Dec. 10: The Pyramid mine is about nine miles west from Placerville, near the junction of the Coloma and Folsom roads. Some years ago a company undertook to work it, and erected a 15-stamp mill, but the ore paying only $3 or $4 per ton, and the owners knowing nothing about the value of sulpburets, work was soon suspended. One of the owners, however, believing that the mine could be made to pay, secured a controlling interest, and in July last procured a boiler. engine, etc., and rigged up a five-stamp battery for prospecting purposes. The ledge is over 50 feet wide, and a shaft 8x12 feet has been sunk in the centre of it. Like many other miners of late, J. W. Hodgkin, who is the gentleman referred to above, finds that his sulphurets are worth more than the quartz, which, however, is paying better than when formerly worked. Mr. Hodgkin was so well pleased with the latest crushing that he and his son have bought all the shares, and are now putting in a burdy-gurdy wheel to run the five-stamps and Frue concentrator already in position, until spring, when, upon the further development of the mine, such improvements will be added as the mine will warrant. We shall watch the working of this mammoth mine with much interest. We have had considerable to say about the property which is in White Oak Township, and have predicted that when properly opened, it would show up as one of, if not the best, mines in the county.

Modoc.

HAYDEN HILL.—Cor. Modoc *Argus*, Dec. 13: G. F. Hoes has sold his "Brush Hill" to Ed. Beckman and Frank Vanderelst, and has leased his "Evening Star" mine to Dan. McClane and Willis Howard, for an indefinite length of time. Harbert and Lewis have shut down their mine, and leased the same to Nelson and Shelby. Dr. Taylor and Bud Hatton will soon commence work on their claim adjoining the "Juniper." The "Golden Eagle" and "Hoes' mills and the "Juniper Arastras" are still at work.

Mendocino.

COAL.—Ukiah *Democrat*, Dec. 13: Last Tuesday morning we accompanied J. H. Falkner out to his coal ledge, on Ackerman creek, about three miles northwest from Ukiah, to see what had been done, and to learn from actual observation what prospect Messrs. Falkner, Reed & Hagans had for a coal mine. The original discovery was made about ten years ago, when Mr. Falkner was prospecting for cinnabar or quicksilver ore, but no effort was made to work the mine until quite recently. It is located on the north side of Ackerman creek, on the land of I. C. Reed, and on the line of the old-time road (not now in use) leading to the redwoods above. A depth not exceeding ten feet bas been reached, while the mountain side has not been penetrated over three or four feet, and yet two veins of coal have been uncovered which widen out and improve in quality as the work progresses. A quantity was brought to town last Monday and tried at the blacksmith shop of Charlton & Dobkins, when it was pronounced stone coal of a quality superior to anything heretofore discovered in California. We trust the owners will push the development of the mine, and finally get rich by their enterprise.

Mono.

THE BODIE MILL TO CLOSE DOWN.—Bodie *Free Press*, Dec. 10. Hauling ore from the Bodie Con. to the mill was suspended to-day and the mill will shut down in a day or two, immediately after a clean-up. Several reasons are assigned for this, among which is the great expense and difficulty during the present cold weather in keeping up the water supply, but the principle cause is probably the desire to prospect the mine more thoroughly and put the ore bodies in shape for a continued run and a fair average in the output. Captain Kelly states that a large force will be kept at work prospecting the mine; that the number of men employed will not be diminished.

CAUSE OF THE BODIE MILL CLOSING.—Bodie *Free Press*, Dec. 13: The real cause of the Bodie mill being temporarily closed down, appears to be on account of water. The muddy water used for some time past is reported to have nearly ruined the boilers, and following this the late severe cold weather froze up the supply, such as it was,

Mariposa.

MINE SOLD.—Mariposa *Gazette*, Dec. 12: C. S. Thompson has sold his quartz mine and mill, in Cathey's Valley, to Supervisor-elect Dickinson, and on Monday morning last left for San Jose. G. W. Barley passed through Mariposa this week on his way to San Francisco, where he will have some rock from his mine, near Hite's Cove, tested by a milling process. The rock works $70 per ton in an arastra. While below, Mr. Barley will make an effort to get some moneyed men of his acquaintance to come up and look over the route of the proposed wagon road to Yosemite up the Merced river.

HORNITOS.—At present the moving of the hoisting work and machinery, from the old Washington mine to Quartz Mountain, is keeping busy, men and beasts. Wagons are slowly wending their way towards it, groaning under the load of ponderous machinery, immense smoke-stacks and all kinds of cast-iron contrivances. The Co. are pushing their works as rapidly as they can, and already the old mine presents a busy scene. Quartz mountain is one of the oldest and best mines in this section of the country. If some of our old mines, now lying idle, were taken hold of and worked in earnest, the probabilities are that their owners would be surprised at their richness. Men thoroughly acquainted with the Washington have told me that there is far better rock below the lower level than any that has come out of the mine. This mine has been, till its closing down, one of the best paying in the county. But the greatest drawback this county has had, and is still experiencing, is the inefficiency of men sent here by eastern companies to take charge of and run a mine.

THE VANDERBILT MINE.—This has formerly been known as Buckingham mine, as it is located on a mountain of that name, familiar to the people of this section. The Buckingham mountain is about eight miles east of Mariposa. The Vanderbilt is an old mine, having in the past been owned by several parties, but lastly fell into the hands and ownership of James H. Hall and a Mr. Starr. In years gone by, the mine was worked by parties who built an eight-stamp mill with two batteries, run by water power, which power was quite insufficient as the water source was limited, and principally dependent upon a wet season. Then again, the mill and machinery was too inferior to make it a lasting success, although considerable rock was ground, and more or less gold taken out. The vein is large, and to all appearances inexhaustible, and the facilities for getting out rock in large quantities at comparatively small expense, are very great. Mr. Hall, who is a man of enterprise and energy, had, no doubt, become satisfied before purchasing, that this was no ordinary mine; hence, the present status of this mine, and the outlay of capital that is being expended in first-class machinery, and the opening up of the mine with a view to more extended operations in the future. A new ten-stamp mill, with engine and boiler all complete, is now in motion and grinding rock. The company is preparing to put in two new concentrators, and will soon be in readiness to give employment to an additional force of men, and run the mill night and day. At present they have about a dozen men employed, which includes miners and wood-choppers, etc. They have a boarding house, blacksmith shop and office at the mill, which is about one-half mile from the mine, which gives to the place an appearance of business and prosperity. The general impression is that the rock will pay from $12 to $15 a ton. It is said the rock is largely impregnated with sulphurets, which must necessarily be rich, as the company contemplate, sometime, putting up chlorinization works.

Nevada.

THE GREAT QUARTZ MINES ABOVE WASHINGTON.—Nevada *Transcript*, Dec. 13: Skirting the South Yuba river, and six miles above the town of Washington in this county, is one of the most thriving and promising quartz mining districts to be found on the coast. It is the center of a vast mineral belt extending for many miles across the rugged and picturesque country, ribbed with great fissure veins of ore that crop out from the mountain sides. In what is known as the Washington district, the entire network of veins prospect in free gold. Claims are being opened in all directions, and the industry, excitement and rush of a prosperous mining region are apparent on every hand. The first claim we stopped at was the Cornucopia and Secret Treasure, being developed by an English company to which it belongs. There are in the location four ledges varying in size from 3 to 15 ft. The formation is of gneiss granite, a sure indication of permanency. All last summer men were employed in carefully prospecting the deposits, and in most places they widened and otherwise improved with depth. Five hundred tons of ore from these mines have been crushed and yielded $20 a ton in free gold, besides giving traces of silver. We judge there is enough ore "in sight" and easily quarried out to keep a 20-stamp mill going for a score of years. One of the valuable features of this property is the cheapness and convenience with which it can be worked. Free water is secured by catching up that which has been used by the Lindsay mine, the machinery of which latter is perched on the abrupt mountain side 1,700 ft higher perpendicularly. Fourteen hundred ft of flume will carry it from the gully in which it comes tearing down from the Lindsay around a jog in the mountain to where the sheet-iron pipe begins, and in this pipe it will be led down to the 10-stamp mill which is being built in the bottom of the gorge equi-distant from the quartette of ledges and connected with them by tramways for cars in which to transport the ore from them to the batteries. A fall of 340 ft is secured for the water. A force of 20 men is employed in constructing the flume and ten are laying the pipes. Eight carpenters and as many helpers are building the mill, and the stamps will be dropping by Jan. 15th if no misfortune occurs. On the 15th of last month the order was given the Union Foundry of San Francisco to cast the battery and stamps. The lighter machinery was ordered at the Plaza Foundry at this city. The Lindsay mine, skyward from the Cornucopia and Secret Treasure, bas been in operation for several years, and has produced not only enough gold to pay for the improvements upon it but has given its owners a fine surplus. There is a large, strong true-fissure vein which has been prospected to a considerable deptb in various parts and with the best of results. A new mill is now being put in, the old one having outlived its usefulness. One of the best water rights in the mountains belongs to this property which is owned by Bell & Co. The next mine visited was the Yuba, owned by Hearst, Haggin & Co., San Francisco capitalists. It lies just across the river from the Cornucopia and Secret Treasure. The shaft is down more than 600 ft, and the mammoth ledge is thoroughly prospected, showing practically inexhaustible resources in the shape of good-milling ore. The 15-stamp mill runs constantly, and it will, we understand, be greatly enlarged next season. The company obtains free water from the Yuba with which to run its machinery. A visit was next paid to the Eagle Bird, a short distance above the Yuba. This mine has been in operation for about a year, and has paid enormously for the amount of work done. There are fine hoisting works, and the mill heretofore used being found insufficient of capacity, one is being built now that will compare favorably with any in the State. Twenty stamps will soon be running, and twenty more are to be added in the spring as early as the roads are open. The mill and hoisting apparatus are run with free water from the Yuba. The Celia, adjoining on the south and in the same mineral belt, is another mine worth having. At the depth of 70 ft a cross-cut shows the distance between the walls to be 15 ft, all milling ore. No mine in the district shows better in free gold. The vein crops out for a distance of 4,500 ft and is large, strong and well defined. There is connected with the property an ample supply of free water to run a 40-stamp mill. Another season, and there will be, if we are not much mistaken, such a "boom" in Washington district as to make the oldest gold-digger open his eyes.

NOTES.—*Foothill Tidings*, Dec. 13: North Bloomfield mine has not found any driftable gravel yet, although they have been hunting for it. Mining men from foreign parts are passing every day up to Washington township, Nevada county, looking at the quartz there. The quartz is good. The newly worked quartz ledge of Selby Hill, Nevada City, has given a crushing of $14 a ton. That is pay ore wherever it may be found.

THE FLOYD MINE.—*Transcript*, Dec. 12; The mine on Selby Flat, near Delos Calkin's ranch, owned by the Floyd Brothers, David Ayres and Will Thurston, is looking well. The shaft is down 73 feet, and shows a three-foot ledge of ore, in all of which can be seen free gold. A tunnel is being run 300 feet to tap the shaft at a depth of 90 feet. Some parties went out there at daylight Wednesday morning and located both extensions.

PROSPECTS OF A GOOD MINE.—*Herald*, Dec. 13: The quartz mine owned by John Curry and R. E. Robinson, situated near Rush creek, about three miles west of town, continues to look well, and gives every indication of developing into a good-paying property. At the bottom of the shaft, which is 90 ft in depth, the ledge is 18 inches wide, and is between slate and granite walls. The quartz taken from it has a rusty looking appearance, and contains considerable sulphurets and galena. Free gold can be seen in many of the pieces. Miners who have examined the rock estimate that it will yield in the neighborhood of $15 to the ton. There are 30 tons now on the dump ready to be crushed. Besides this there is a considerable quantity of rich ocher, which the ledge carries with it. The owners expect to make arrangements soon for the erection of a small mill, and thus save the expense of hauling their ore three or four miles. A new shaft is being sunk to tap the ledge, at a point where it is known to be much wider than in the present shaft.

Plumas.

SNAKE CREEK.—Cor. Plumas *National*, Dec. 13: We have not been idle in developing some of the best mines in the State, both placer and quartz, and we find to-day our county is just being developed as to the sources of her rich placer diggings. Our county will yet be sought after for her mines after the debris muddle is settled and the miner gets his rights. Plumas county has, since 1852, furnished to world over $4,280,000 in gold, and we are yet in the infancy of mining proper, or quartz mining, of which I may write more anon.

Sierra.

ALASKA.—*Mountain Messenger*: The Alaska quartz mine, Col. E. P. Bates Supt., has from 75 to 80 men constantly employed. Frank Lewis is day foreman, and Thos. Davis, cousin of Watson Bayles, Forest City, night foreman. About 20 more men are employed by timber contractors. The shaft is down 475 feet. The water is being taken out by two Hooker Steam Pumps—the large one at No. 3 level, and the smallest at No. 4. Development work is being pushed to the utmost. It is intended to soon place a large compound Worthington steam pump at No. 3 level, of capacity and make to throw the entire volume of water at the mine to the drain tunnel, at a single lift, and thus economize, by using but a single pump, bolding the others in reserve. The mine is more than paying the expenses of its development, and ample preparations are being made for winter. The management are averse to any but conservative statements being made as to the work or product of the mine, but mean business. Everything is quiet at the Oriental and Kenton quartz mines. No work is being done there by the owners. Doc Bowers has charge of the Oriental, and is prospecting around for gravel, and H. H. Brown, of the Kenton, prospecting for quartz to put in time to keep up assessment work. Golden King Co., Supt. Weldon in charge, are running a tunnel to strike their ledge. As the croppings are rich, and quartz in the shaft as good, the prospect is fair for this being proved a valuable mining property. Four men are employed. There are a blacksmith shop and boarding-house at the mine. Oakland capitalists are engaged in this lucrative enterprise. W. M. Toll and others have, by purchase and relocation, consolidated the mining ground lying between the Basalt claim, at Monte Christo, and the Phœnix, at Fir Cap. A new tunnel, centrally located, will be commenced immediately, for the development of the ground. This strip of country has never yet been intelligently prospected, and the chances are more than good for a valuable property. J. K. Walls came over from Howland Flat Thursday, and reports the future prospects for that pioneer mining camp more promising now than they have been for a long time past. Jack Richardson is putting up a chute, 330 feet long, at Black Dog, on the Middle Fork, intending to rework the gravel deposit, so often attacked by former prospectors. The Duteh Co., Poker Flat, have found some fair looking rock, in which gold can easily be seen, and are now running a tunnel for their ledge. Lincoln Co., Howland Flat, have raised three chutes up to gravel that yields three dollars per carload. Empire Co., Howland Flat, have 50 men employed, and clean up 50 ounces a week.

AT THE YORK MINE.—A *Tribune* reporter paid a visit to the York mine, in Slug canyon last week. A great deal of work has been done there in a short space of time. The frame work for the eight-stamp mill is all up and under cover, and the Pelton wheel and batteries are being placed in position. The wheel is to be run by water, under a pressure of 227 feet. Slug canyon and Mt. Vernon ravine furnish the water supply. It is bulkheaded about 430 ft above the mill. The bulkhead and flume is completed. The vein is to be worked through the lower tunnel. A double-track tramway is nearly completed, over which the ore will be conveyed to the mill. It is expected to have the mill running in good shape by Christmas.

PROMISES DIVIDENDS.—Redmond and Cadman are getting things in shape to thoroughly develop their newly purchased claim at American Hill. At present they are driving a raise from the face of the tunnel for the double purpose of prospecting and making connection with a shaft sunk from the surface. When they get the ground fairly opened there is every indication that some dividends will be declared in that quarter.

THE WISCONSIN MINE.—At the above mine, located near the Ruby ground, the owners are preparing to start ahead the new tunnel, which is now in 300 feet. Last October a raise was made in the face of this tunnel, and gravel encountered that prospected well. As the bedrock is pitching into the hill, they expect to strike gravel in 100 ft.

Shasta.

OUTLOOK.—Shasta *Democrat*, Dec. 13: The mining outlook in this county is more encouraging every week. We are told by gentleman who ought to be well posted, that the people composing the Denver Smelting Works Company are thinking seriously of erecting branch works up on the river at a point not yet decided upon. We heard one gentleman who is extensively interested in Iron mountain say that he is satisfied the Denver Company will certainly put up the much-talked of smelting works. The Hardscrabble mine near Igo is being put in good order for the winter's run. At South Fork a number of arastras are running on paying ore, and as soon as rain comes considerable placer mining will be carried on in the district. York and Barnes have just finished their assessment work on the Black Jack mine on Flat creek. The upper tunnel was run about 30 feet ahead, showing a fine body of ore that averages about 20 inches in width, which prospects first-rate in a mortar.

ROUND MOUNTAIN.—Shasta *Courier*, Dec. 13: In regard to mining items there is nothing very encouraging to write. The district still continues to slumber. Occasionally a prospector puts in an appearance, but soon leaves with specimens from the mines, and reports are favorable as to the assays, but no regular work going on.

Siskiyou.

ORO FINO ITEMS.—Cor. Yreka *Union*, Dec. 13: The outlook for placer mining is remarkably poor, there being scarcely water enough for house use. The quartz mines of this locality are prospecting well. A. M. Johnson finished crushing 130 tons of rock about the 20th ult., which was taken from all parts of the ledge, which averaged a fraction less than $30 per ton, or $3,880. Allen Bros. have struck a new pay chute some 200 feet north of their old works, and rumor says that the prospect is actually flattering. This mine has been successfully worked for several years past, and has yielded thousands of dollars to its owners. There are four or five brothers concerned in the mine, and while three of them run the mine one stays at Shackleford creek and mills the rock.

San Bernardino.

CALICO.—*Print*, Dec. 14: While the King mine increases in value in proportion to the depth reached, the same may be said of many others. The Sue is probably the most remarkable mine in the district. The ledge, as uncovered from the falls to the apex of the mountain, where the main shaft is being sunk, and has already reached a depth of 60 feet, shows a large, well-defined ledge, between porphyretic walls, all paying ore, much of it extraordinarily rich in chloride, horn and metalic silver. The main ledge, at the depth named, is fully nine feet wide, and while ore averaging over 100 ozs. to the ton is being transported at present to the mill, there is on the various dumps of the Sue an immense quantity of ore which would make the heart glad of him, who in

some silver camps is satisfied with an average of 40 to 75 ozs. per ton. There is every indication that this mine is a veritable bonanza, and the company owning it will probably in a short time erect a mill near Daggett, for working their rich and abundant ores. The Bedford Forest mine, in the vicinity of the Sue, being worked under a lease, is developing some remarkably rich ore as depth is attained, and also a well-defined ledge. In East Calico the Bismarck, Oriental and other mines adjacent are increasing their output daily. The Cuba mine and others in that vicinity, are continually increasing in promise. The Taggart mine, which has furnished some of the richest ore taken from the camp, has, within a few days, been bonded with a working lease, and will probably soon be in the hands of capitalists, who will work the certain ledge for all it is worth. There are reports of new milling facilities projected, which will be noted as they take shape and reach certainty. While there is a large quantity of ore in sacks, and upon the dumps waiting transportation to the mills, the shipments of bullion are steadily increasing. The Barber mill will soon be in running order, and a rapid increase of bullion products from this camp may be confidently expected upon its completion. There are few idlers in this district, and little need for any. He who can delve for chloride ores with common sense and industry, may find opportunities in the Calico Mining District to better his condition, which are not presented in any other district in California. It is unquestionably, not only a good "poor man's" camp, but an inviting one for capitalists.

Trinity.

NEW RIVER ROAD.—Trinity *Journal*, Dec. 13: We had the pleasure this week of meeting Mr. E. M. Wallbank, Traveling Agent of the Central Pacific Railroad Company, who comes to Trinity county for the purpose of visiting the New River mines and reporting as to the prospects there, and also regarding the character of the route *via* Weaverville. On Tuesday we accompanied him over the wagon-road as far as the town of North Fork and from there he started in company with Mr. C. W. White, for New River *via* Rattlesnake, expecting to spend two or three days at the mines and return here Monday or Tuesday next. Upon his report will depend the action of the Railroad Company so far as assisting the building of a road to the new district is concerned. The many advantages of this route are so plainly apparent that the investigation can only result in favorable action. We are well pleased to have the Company manifest an interest in this direction, and fully believe the prospects will more than justify any assistance they may render in opening up this new and very promising Quartz Mining district.

NEW RIVER.—Shasta *Democrat*, Dec. 13: A gentleman, just down from Trinity county, informs us that gold quartz ledge discoveries in the New River district is creating quite an excitement in that part of the country. This region is about equal distance between Weaverville and Humboldt Bay, and wagon roads are being projected from both points to tap the mines there. Our informant anticipates a big rush for those mines in the spring. Mining men in San Francisco are also considerably worked up over the reports of the recent rich discoveries in that region. Wm. T. Coleman of San Francisco recently gave $24,000 for a quartz claim situated in the East Fork mining district of Trinity county. We are informed by Mr. Miner, the gentleman who purchased the property from Mr. Coleman, that this property has every indication of becoming one of the richest mines in the State.

Tuolumne.

GOLD.—Tuolumne *Independent*, Dec. 13: Four different parties are taking out quantities of gold from the Garrett mine, in Bald mountain, opposite Brown's Flat. The claim has been leased to them, and the lode is reached by tunnels and shafts—in each of which rich pay has been found. Our informant could not give figures, only that "they were raking it out good."

NEVADA.

Washoe District.

UNION CON.—All work on the 3300 level has been discontinued, and the machinery, car tracks and air pipes are being hoisted out. It will take several days to thus strip the mine below the 2700 level. Once this is done, new arrangements will be made and prospecting will be commenced above at what is considered the most favorable point.

CON. CALIFORNIA AND VIRGINIA.—The northwest drift is now near the point where should be encountered the streaks of ore that were being worked some years ago when the fire broke out in the old timbers. It is thought that a great quantity of paying ore will be found in this section of the California ground.

COMBINATION SHAFT.—The large station at the 3000 level is completed and the new hydraulic pump is being set up. The tank station, on the west side of the big pump station, is also completed, and the tank is being constructed. The new pump will be running on or before January 1st.

ANDES.—The fire in the old upper levels of the Ophir produced and spread abroad an amount of smoke and gas that a good deal interferred with work in this mine for three or four days, but this trouble is now over, and work has been resumed at the usual points.

GOULD AND CURRY.—On the 825 level the west cross-cut at the Savage north line is still finding mineral-bearing quartz of good appearance. Although all this quartz gives assays of from $1 to $5, no paying body has yet been found.

BEST AND BELCHER.—The west cross-cut on the 825 level at the Gould and Curry north line is now in vein material of a very promising appearance. It has yet a long distance to go to reach the west wall.

OVERMAN.—About the usual amount of low-grade ore is being taken out of the old upper levels. Sufficient ore is in sight to keep a small force of men employed for many months.

SAVAGE.—The E-tunnel is now about in the point where it will encounter the northern continuation of the ore body that is being worked in the Hale and Norcross.

SCORPION.—On the 500 level the north drift continues in vein porphyry, with occasional streaks of quartz and small seams of clay. Not much water is encountered.

BELCHER.—A considerable amount of low-grade ore is being extracted and the usual exploring work is being done for the purpose of opening up new ground.

YELLOW JACKET.—A considerable amount of ore that will pay a fair profit for milling is being taken out, and the usual prospecting work is being done.

CROWN POINT.—About the usual quantity and quality of ore is being extracted and sent to the mills.

SUTRO TUNNEL.—*Enterprise*, Dec. 10: Following is the report of progress and details of work in the Sutro tunnel during the month of November: Between points 6,300 and 6,700 of main tunnel, repairmen have removed of old timber, 33 posts and 17 caps, squared ground and put in place, of new timber, 54 posts and 26 caps; also, picked down loose rock from roof of tunnel, relagged old sets of timber, lagged, blocked, filled and braced new sets and cleaned up debris. Retimbering at above points being completed, the same begins 23 feet four inches west of point 6,600, and extends in the same direction 43 feet and three inches; also, beginning six feet six inches west of point 3,300, retimbering extends west 265 feet and six inches. Between 11,200 and 11,300 points 100 feet of new covers and four sides have been attached to drain boxes. Between between points 12,000 and 17,000 general repairs have been made to track and guard planking. South Lateral—During the month some slight repairs have been made to drain boxes. Flow of water in standard gallons per day 8,852,600.

HALE AND NORCROSS.—*Enterprise*, Dec. 13: The main winze now has but about 20 feet to go to reach the 3000 level. The west cross-cut on the 2800 level is passing through quartz of excellent quality that shows spots of good ore. The extraction of ore from the 200 level has been discontinued, as the grade has become to low for working. The new hydraulic pump is being put in place at the 3000 level of the Chollar-Norcross shaft, and soon all will be in shape to thoroughly prospect all the ground between that point and the 2800 level. The indications are that about the 2900 level a good body of ore will be found, as the ore found on the 2800 level appears to be making downward.

OPHIR.—Good progress is making in the west drift on the 500 level, and the old workings will soon be tapped. The fire in the old timber in the croppings did but little damage. Work on the 250 level will proceed as usual. There is yet a considerable amount of ore in the old drifts that can be taken out and worked to a profit. Good headway is making in the west cross-cut from the main south drift on the 1500 level. Work has been suspended in the joint station on the 3300 level.

ALTA AND BENTON.—Owing to the heavy flow of water, work in the lower levels of these mines has been suspended. The officers of the company it is understood, have concluded to begin prospecting work in the old upper level above the point to which the water will rise. There is a large area of ground about which little is known, and in some part of this may be found a body of ore that will pay for working.

ALPHA.—The large body of quartz found on the 600 and 900 levels is being very thoroughly explored. The vein is over 100 feet in width and is mineral bearing throughout, the assays running from $1 or $2 up to $60. Thus far, however, no place has been found where the pay rock is sufficiently concentrated. Could a width of 20 or 30 feet be found that would average $12 a ton it might be worked at a fair profit.

SIERRA NEVADA.—In accordance with the new departure, the machinery, car tracks and air pipe are being hoisted out from all points below the 2700 level. Once this work is completed, explorations will be resumed at points above where ore was found some years ago. There are several places where there are streaks of ore from one to three feet in width, and these may lead to workable deposits.

MEXICAN.—All the machinery, air pipe and car tracks below the 2700 level are being hoisted to the surface preparatory to a new departure looking to exploration of the ground heretofore passed by. There is much ground above the 2700 level about which nothing is known. At the 2700 level is a considerable streak of ore that remains to be worked.

UTAH.—On the 1930 level the southeast drift is still in vein porphyry. This rock, however, is not so solid as it has heretofore been. Seams of clay and occasional stringers of quartz are beginning to appear. The drift is now nearing a point where a large body of quartz cut in the upper levels on the Cedar Hill side of the ravine is likely to reappear.

Bernice District.

BULLION.—Reno *Gazette*, Dec. 13: The Golden Crown Mining Company shipped six more bars of silver, valued at $7,500, consigned to Livingston & Co., San Francisco, the products of 21 days run run of a 5-stamp mill. The main tunnels were run in the month of November, the Curtis, 68 feet, and the Williams, 57 feet. In the Curtis there was encountered a fine ledge, which fills the entire tunnel with high grade ore, and the stopes Nos. 8 and 9, also show a fine ledge 15 inches wide. The Williams tunnel was run through a pay chute in the month of November. The pay chute is 67 feet long and an average width of 18 inches. The samples go from $80 to $100. The mine looks better as they go into the mountain. There is no water to contend with, and the mine is well ventilated. There are plenty of men in the camp at present.

BULLION.—*Silver State*, Dec. 16: Superintendent Williams arrived from Bernice last Thursday, bringing six bars of bullion valued at $7,500 from the mill at that place. He reports the mill running steadily, the mines looking well and producing lots of ore, and everything about the place looking prosperously.

Cherry Creek District.

ORE SHIPMENT.—White Pine *News*, Dec. 13: A carload of high-grade ore is now ready to be shipped from the Exchequer mine to Salt Lake. The mine is looking well, and more shipments of the same kind will follow at intervals during the winter. If this property were located on the Comstock, instead of Cherry creek, capitalists would be offering a million for it, and we believe it is worth it, if in the hands of men who could place in in position to systemmatically extract its hidden wealth.

Columbus District.

MOUNT DIABLO.—Candelaria *True Fissure*, Dec. 13: During the past week a chute has been put in on the sixth level, and the sinking of the incline has been stopped for the present. The north cross-cut on this level is now in 62 feet. The west drift on the fifth level has been driven 10 feet during the week, and there is an irregular ledge, of some 8 or 10 inches wide, of $100 ore, showing for this distance; but the ore is not regular. A raise has been started on this ore, 35 feet from the surface, and shows a few inches of $100 ore. The west drift from the south cross-cut on this level, is in 42 feet, and shows small streaks of $60 ore. In an upraise from the east drift on the fourth level there is a small spot of $150 ore. The south cross-cut, from the west drift on the fourth level, has been stopped after reaching a length of 55 feet, and drifts started east and west on a ledge cut by this cross-cut. In the east drift there is a little $60 ore showing. The various stopes and workings in the upper part of the mine are looking well and giving considerable ore.

Delaware District.

GOING ON WELL.—Virginia *Enterprise*, Dec. 14: J. S. Hardwick is in from Delaware district. He says all is going on well and smoothly in that camp. There are but four men in the place; all, however, are at work and doing well. The amount of ore taken out is not large, but it pays regularly about $30 a ton. Mr. Hardwick says they have no very big thing as yet, but all are well satisfied. They have a sure thing on good pay for all the work they do, and expect one of these days to drift into something big. When they first went into the district all hands put in their time at looking for a big bonanza, and would pay no attention to anything of ordinary value, but now they take what pays and trust to luck for a bonanza.

Tuscarora District.

BELLE ISLE.—Tuscarora *Times-Review*, Dec. 11: There is no material change to note in any of the workings.

NORTH BELLE ISLE.—Total length of drift north, on the 70-foot level, 85 feet. This vein continues favorable.

INDEPENDENCE.—West drift, 400-foot level, has been extended 367 feet; progress 15 feet. No. 1 upraise, 175-foot level, has been carried up 20 feet; No. 2 upraise, 10 feet; No. 3 upraise, 9 feet. The vein above the level is yielding good ore.

GRAND PRIZE.—South drift on the 400-foot level extended 11 feet during the past week. Work has been suspended there for the present on account of bad air. The stopes are producing the usual amount of ore, but it is not as good as it was. Mill running steadily and doing better work than usual.

NAVAJO.—Upraise south of No. 2 cross-cut, 150-foot level, is up 41 feet, and looking very well. No. 1 cross-cut 350-foot level, has been extended 10 feet; total length three feet. Stopes are yielding the usual grade and quantity of ore.

ARIZONA.

MINING NOTES.—Prescott *Courier*, Dec. 13: George Zika is getting ready to run his arastras on lower Agua Fria. He has a ledge which produces good free gold rock. The United Verde company have about a month's supply of cake on hand. They are running out copper-silver bullion with one smelter. The other smelter has not yet been started. The Rapid Transit mine, in Bradshaw district, is highly spoken of by miners and experts. Placer miners of Hassayampa and Lynx Creeks have commenced washing gravel, and, of course, saving gold. The Alter mine is now prospected by a shaft 40 feet deep, with drifts north and south, showing 18 inches of good ore.

IDAHO.

THE PHILADELPHIA COMPANY.—Wood River *Times*, Dec. 9: The campaign of the Philadelphia Smelting Company has been quite brief and very unsatisfactory this year. Only one stack (out of four) has been in operation this year, and that did not run steadily. The campaign did not begin until the middle of June. The total output this campaign has been about 1300 tons of bullion, worth an average of $300 per ton, or an aggregate of about $400,000. This small yield is due entirely to the conservative policy pursued by the company, as ore has been so plentiful, in and around Ketchum this year, that over 1,000 tons were shipped to Omaha, Kansas City or elsewhere.

REVISING THE ORE TARIFF.—Advices which are probably reliable are to the effect that the Union Pacific Company is considering, in its slow and tortuous way, the reduction of rates on ore from Wood River to the various smelting works. At present the company carries all classes of ores from Butte to Omaha or Denver for $17.50 per ton, while from Wood River—300 miles nearer the terminal point—it charged $25. This unfair discrimination cannot, of course, long prevail, and that is why a new tariff is in contemplation which will fix better and more equitable rates for Idaho. These should, of course, be based upon the value of the ore, and graduated from, say, $10 to $20. If this is done, it will give full satisfaction to every ore producer in this section.

NEW MINING CAMP.—Eagle Rock *Register*, Dec. 10: During the past summer Mr. J. B. Irwin, an old prospector and miner, has been prospecting up Snake river, and has found some of the best placer claims on the river. Some time ago he found what he considered good float, but did not have time to look for the ledge. A few weeks ago, however, he commenced looking around, and in about a week was successful. On Saturday last he came to town, bringing some large specimens with him. A sample was sent to McVicker, at Salt Lake City, by Anderson Bros., the returns being received yesterday, which are $180.87. As the sample was from the top of the ground, it would seem to indicate that there is something in it. The location is on what is known as Fall Creek, about fifty miles up Snake river. Fall Creek and Carribou Creek head almost together, and Mr. Irwin claims that this is the same lode and only about ten miles distant from the Carribou mines for which $60,000 has just been offered by the Ontario Company. The ledge is about 12 ft wide and crops out in many places. The formation of the country is porphyry and granite. There has been considerable excitement in Eagle Rock over it, all being anxious to see the report of the assayer, and quite a number are now getting ready to go up to the new camp as soon as possible. Mr. S. C. Winters and others are interested in it.

THE LOST RIVER SMELTER.—County commissioner Vanlandingham has again returned from Huston, Lost River, to Hailey, to see what the commissioners would decide to do with regard to throwing out the votes of Ketchum. When he left Huston, the smelter had been running three days, and had turned out eleven or twelve tons of copper bullion. The bullion is nearly pure copper with some silver. The smelter will run as long as the present favorable weather shall continue, but when snow and cold weather come on it will be closed down until the spring.

BONANZA AND CUSTER.—Idaho *Keystone*, Dec. 13: Another rich body of ore has recently been discovered in the Custer mine. It was supposed that the vein proper, or where the outcrop showed so prominently on the surface, was about exhausted; but explorations have been going on all the time, with the above result, showing that this ledge of huge proportions set up edgeways on top of the ground had roots proportionately large. It is said there is ore enough in sight to run the mill two years. The Whale mine, across Jordan creek from Mount Estes, and owned by James Hooper and the Galatian brothers, was leased this fall to five men—James Reynolds, James Troyna, John McCane, William Merritt and Oliver Blanchett. Since then they have done a large amount of work. Have put up a dwelling house, a blacksmith shop, besides doing many other things that were necessary for the convenience of working the mine. They have also taken out eight and one-half tons of ore, which was shipped by pack-train to the Custer mill and crushed, paying $180 per ton. Only four of the men are working at the mine. They are all good, practical miners, and by spring will have a large quantity of ore on the dumps, and also have much done in the way of development. Superintendent Hooper, of the Montana mine, has got in all his supplies for the winter, and has twelve men employed. In the next few months more than usual will be done in the way of development, and it is to be hoped the ore taken out may, next season, yield as rich profit to the owner as it did this. A short distance from the Montana, on Mt. Estes, the Goldstone is being worked by a company of four men. This fall Tom Flint and Alex. Robinson made a discovery that they thought would justify them in bringing in a supply of provisions for the winter, and they feel confident they have a rich mine.

NEW MEXICO.

SIERRA.—Cor. Rio Grande *Republican*, Dec. 10: The Sierra mining companies, during the past 15 days, have been shipping 150 tons of second-class ore, daily, in addition to the regular shipment of 120 tons, per week, of high-grade ore, making in all 1,120 tons weekly. It is rumored that the Pueblo smelting company leased the Sierra Apache, and at an early day, contemplate putting on a force of men. The high percentage of iron carried in the ores, has made a demand for them as fluxing material. The Apache can furnish very large quantities of this class of ores, which will be quite an item to the working force of Lake valley.

UTAH.

SUSPENDED.—Park *Record*, Dec. 12: The Bon Homme company has been forced to suspend operations for the present for lack of funds to prosecute their work. The stockholders should remember that nothing can be accomplished by idleness. Our greatest mines have been opened by persistent, bulldog pluck, and inasmuch as the Bon Homme property is in an excellent locality, it seems to be folly for the stock-holders to hang back when a second rebellion is almost within their grasp. The west of Daly's, on Pioneer Ridge, is receiving close attention from interested parties who believe they know the vicinity of the course followed by the great lode along that ridge. Mr. Pierson is now pushing the old Pioneer with a tunnel driven to cut the apex on the ridge and lode, from South side. If Daly's ore body is a continuation of the Ontario (of which there is, no doubt), then the formation and line of strike should carry the vein along the comb of south slope of said mountain, between this camp and the Cottonwoods, while but one reliable strike has been made along this line (the Calumet). Sufficient work has been done to show that a powerful lode runs the entire length without a change of formation. Carrying a lime hanging wall with a heavy iron gossan cropping, over a body of high grade ore, with a foot wall of zinc blende, mixed with galena, backed with quartzite. This is one of the best formations for mineral and the finding of rich ore along the line like that of White Pine, Utah, Rosewood, Pinneo, Maud II., Jupiter, Calumet and Contact, is a guarantee of what may and will be done, on the laying out of sufficient means and labor to develop this great lode. The whole work and expenditure along this line has been in the croppings and broken over debris from the lode, lying below the vein. All the ground has been located and recorded along this supposed line of strike of the lode. About the middle of the week a report was circulated around town that our old friend D. F. Condon had struck it rich in the Creole. Various rumors were afloat, but they seemed so conflicting that a visit was necessary. The Creole has been worked for nearly the past two years steadily, by a tunnel about 100 feet below the old incline. This tunnel was run into the hill a distance of 190 feet through a solid formation nearly the whole length. When within about fifteen feet of the vein, the formation was cut through, and then work progressed somewhat easier and more rapidly. About twelve feet further on Mr. Condon cut the vein, running easterly and westerly, and after satisfying himself that he had the vein, and finding two well-defined walls, he followed its easterly course for a distance of 135 feet, passing through a good grade of ore all the way, and the hanging and foot-wall the whole distance, retaining their solidity and smoothness. In the face of this east drift, the vein assumed a perpendicular position, but maintained its average width, the quality of the ore increasing. Coming back about fifty feet, he commenced an upraise on the foot-wall, and continued up about twenty feet, and then drifted in a westerly course about fifteen or twenty feet, through ore all the way, and with ore staring him in the face at every stroke of the pick. The vein is irregular in thickness, but will average, as far as has been explored, from eighteen inches to two feet. The ore is rich in yellow and grey carbonates, carrying about 60 per cent lead.

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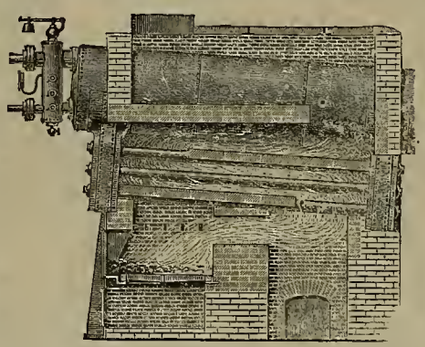

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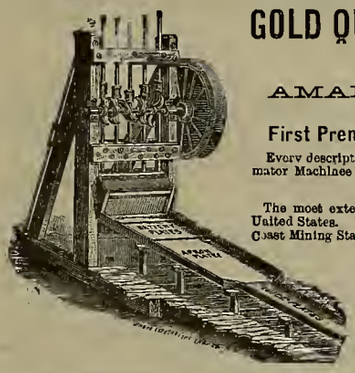

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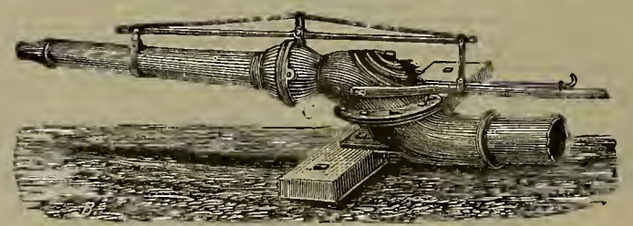

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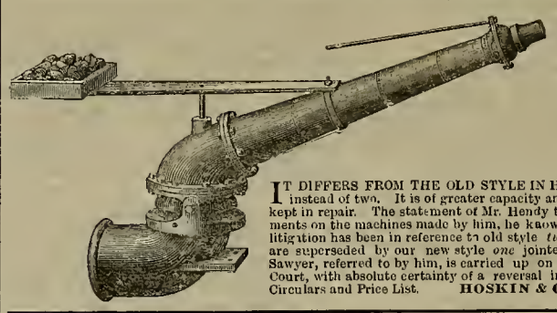

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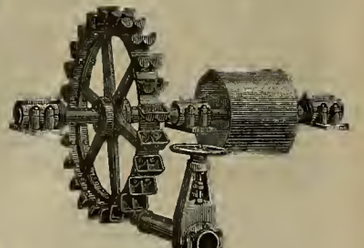

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List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING DECEMBER 9, 1884.

309,021.—MACHINE FOR FRAMING TIMBER—Wm. J. Bley, Silver King, A. T.

308,958.—WAX EXTRACTOR—Jos. D. Enas, Napa, Cal.

309,077.—WINDMILL—J. R. Millard, Los Angeles, Cal.

308,980.—ICE MAKING AND REFRIGERATING MACHINE—C. C. Palmer, Oakland, Cal.

308,923.—STEAM PLOW—W. & J. Paterson, Eureka Mills, Cal.

309,003.—CENTRIFUGAL HONEY EXTRACTOR—O. P. Squier, Santa Barbara, Cal.

309,037.—BRICK MACHINE—C. A. Tarragon, Portland, Or.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise), at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Opening of the World's Fair.

As the New Orleans World's Fair is the greatest industrial exhibition ever held in this country, it is quite fitting that its opening should be characterized by unusual features. As the moving strength was given to the enterprise by the gift of a million dollars by the General Government, it is properly considered that the affair is the property of the people of the country. It was therefore proper that the fair should be opened by the President of the United States. As the President could not be absent from the capital at this time, the aid of electricity was invoked, and the fair was opened by telegraph. The press dispatches, which come as we write, show that the event was notable in its manner, and will no doubt attract the attention of an observing world, besides furnishing materials for artists and historians. The following is the scene and the action:

At 2 o'clock, on the afternoon of Dec. 16, there were about 200 people in the east parlor of the White House. At the east side of the room, stood a small, square table, with a nickel-plated telegraph instrument upon it, and a wire leading from the instrument to the floor, along the floor, beneath a Turkish rug, and outside the window, where it is counected with another wire, which led, without break or interruption, 1,400 miles away to New Orleans. At a table, in the White House, sat Mr. Mareau, one of the oldest operators in the Western Union service, with a pad of paper before him, and his hand on the key, constantly in communication with another operator in the main hall of the Exposition building. Behind this table, stood the President, with President protempore of the Senate Edmunds on his left haud, the Speaker Carlisle, on his right. At the left hand of Senator Edmunds, stood Mr. Morehead, representing the Exposition Commission. Besides these, were members of the Cabinet, except the heads of the postoffice and interior departments, where in New Orleans, Commissioners of the Senate and House, and members of the diplomatic corps, crowded as closely as they could get to the telegraph instrument.

At 2:30, in answer to a lively clicking of the telegraph instrument, Mr. Mareau threw open the key and took as rapidly as he could write a message that covered half a dozen large-size sheets of huff-colored paper. It was the address of President Richardson of the Exposition, announcing the opening and presenting the Exposition, through the President, to the people of the United States. When this message was received Commissioner Morehouse read it in a loud, clear tone of voice to the President, who immediately adjusted his eye-glasses, took from the table before him a small roll of manuscript and read his congratulatory reply. At its conclusion, when he declared the Exposition open, he reached forward and placed his hand upon the telegraph instrument, the operator pressed the key, and the ceremony was at an end. After the President had delivered his address, Senator Logan, representing the joiut committee of the two Houses, appointed to be present at the ceremonies, delivered the congratulations of Congress, which were immediately telegraphed to New Orleans.

It is reported by telegraph from New Orleans that President Arthur's address as received by telegraph was read to the multitude and when the reader concluded with the sentence declaring the World's Exposition open, at the same moment the President in Washington closed the electric circuit, and the machinery was put in motion.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

The pay roll for mines on the Comstock for month of November amounted to about $100,000.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCA	S. NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M and M Co	Alaska	8	50	Dec 10	Jan 11	Jan 31	T J Hay	306 Pine st
Alta S M Co	Nevada	31	25	Dec 24	Jan 9	Jan 28	W H Whatsou	302 Montgomery st
Best & Belcher M Co	Nevada	31	50	Nov 21	Dec 30	Jan 19	W Willis	309 Montgomery st
Champion M Co	California	17	10	Nov 24	Dec 29	Jan 19	T Wetzel	522 Montgomery st
Con Amador M Co	California	8	20	Dec 3	Jan 5	Jan 21	F B Latham	408 California st
Copper Mt Con M Co	California	1	05	Dec 3	Jan 13	Feb 10	A L Perkins	310 Pine st
Chollar M Co	Nevada	15	50	Oct 29	Dec 2	Dec 23	C L McCoy	309 Montgomery st
Con Va & California M Co	Nevada	1		Nov 5	Dec 13	Jan 3	A W Havens	309 Montgomery st
Crocker M Co	Arizona	1		Oct 31	Dec 2	Dec 23	A Waterman	309 Montgomery st
Buckeye Gravel M Co	California	17	05	Dec 9	Feb 7	Feb 16	H Kuntz	328 Sansome st
Gould & Curry S M Co	Nevada	49	50	Oct 25	Nov 28	Dec 22	A K Durbrow	309 Montgomery st
Grand Prize M Co	Nevada	17	35	Nov 24	Dec 30	Jan 28	E M Hull	327 Pine st
Happy Valley Gravel M Co	California	5	08	Dec 15	Jan 21	Feb 9	D M Kent	330 Pine st
Hale & Norcross S M Co	Nevada	83	50	Dec 8	Jan 13	Feb 3	J F Lightner	309 Montgomery st
Indian Spring Drift M Co	California	4	05	Nov 21	Dec 22	Jan 21	A B Paul	328 Montgomery st
Lewis Con M Co	Arizona	5	03	Nov 14	Dec 22	Jan 19	J W Pew	310 Pine st
Mayflower Gravel M Co	California	37	10	Nov 20	Dec 23	Jan 12	J Morizio	328 Montgomery st
Marshall M Co	California	2	10	Nov 6	Dec 15	Jan 5	A L Perkins	310 Pine st
Mexican G M Co	Nevada	28	50	Nov 11	Dec 17	Jan 8	C E Elliott	309 Montgomery st
Ophir M Co	Nevada	48	50	Nov 12	Dec 17	Jan 6	E B Holmes	309 Montgomery st
Rainbow M Co	California	12	15	Oct 24	Dec 1	Dec 29	P F Marhardt	311 Montgomery st
Summer Con M Co	California	2	05	Dec 18	Jan 19	Feb 12	F E Luty	330 Pine st
Silver Lining M Co	Nevada	1	07	Dec 16	Jan 24	Feb 19	J. Stadfeld	419 California st
Standard M Co	California	1	25	Oct 17	Dec 1	Jan 5	W Willis	309 Montgomery st
Sierra Nevada S M Co	Nevada	80	50	Oct 22	Nov 26	Dec 25	E L Parker	309 Montgomery st
Savage M Co	Nevada	61	50	Nov 11	Dec 15	Jan 5	E B Holmes	309 Montgomery st
Union Con M Co	Nevada	28	50	Nov 5	Dec 9	Dec 30	J M Buffington	309 California st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Bradshaw M Co	Arizona	H P Bush	431 California st	Annual	Dec 27
Combination M Co	Arizona	A Waterman	309 Montgomery st	Annual	Dec 26
Gorilla M Co	Arizona	A Enquist	436 Montgomery st	Annual	Dec 25
Head Center & Tranquility M Co	Arizona	J W Pew	310 Pine st	Annual	Dec 26
Jupiter Blue Gravel M Co	California	E Lande	309 Montgomery st	Annual	Dec 24
Mountain M Co		C Herrmann	213 Mission st	Annual	Jan 6
Peer M Co	Arizona	A Waterman	309 Montgomery st	Annual	Dec 26
Peerless M Co	Arizona	A Waterman	309 Montgomery st	Annual	Dec 26
Weldron M Co	Arizona	A Waterman	309 Montgomery st	Annual	Dec 26

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	B L Burling	328 Montgomery st	50	Dec 5
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Dec 15
Darbee Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Oct 6
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Dec 13
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Nov 28
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Dec 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Nov 6

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication in this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.

DATE.	Portland.				Red Bluff.				Sacramento.				S. Francisco.				Los Angeles.				San Diego.			
	Rain.	Temp.	Wind.	Weather.	Rain.	Temp.	Wind.	Weather.	Rain.	Temp.	Wind.	Weather.	Rain.	Temp.	Wind.	Weather.	Rain.	Temp.	Wind.	Weather.	Rain.	Temp.	Wind.	Weather.
Dec 11 Dec 17																								
Thursday	.02	38	SE	Fr.	.00	52	N	Cl.	.60	41	N	Cl.	.00	54	N	Cl.	.03	50	E	Cy.	.10	58	S	Cy.
Friday	.00	28	E	Cl.	.00	48	N	Cl.	.60	43	N	Cl.	.00	47	N	Cl.	.53	54	—	Cy.	.55	54	W	Fr.
Saturday	.00	34	S	Cy.	.00	42	S	Cy.	.00	45	S	Cl.	.00	47	SE	C.	.—	52	E	Cl.	.25	54	NW	Cl.
Sunday	.32	43	SW	Cy.	.00	48	S	Cy.	.60	47	SE	Cl.	.00	50	SE	Cy.	.00	55	SE	Cl.	.00	57	W	Cl.
Monday	.38	32	E	Cy	.00	50	SW	Cy.	.00	51	SW	Fr	.00	52	SE	Fr.	.00	58	E	Cl.	.00	53	NW	Cl.
Tuesday	.90	15	E	I.S.	.44	42	NW	Cy.	.—	48	SE	Cy.	.01	54	SE	Cy.	.00	62	S	Cl.	.00	60	NW	Cl.
Wednesday	.77	20	SE	Cy.	1 63	—	—	—	75	54	SE	Cy.	.49	53	SE	Cy.	.00	61	W	Cl.	.00	61	NW	Cl.
Totals	2.33				2 07				.75				.50				.56				.90			

EXPLANATION.—Cl. for clear; Cy., cloudy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature wind and weather at 11:53 A. M. (San Francisco mean time), with amount of rainfall in the preceding 24 hours

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Nov. 27.		WEEK ENDING Dec. 4.		WEEK ENDING Dec. 11.		WEEK ENDING Dec. 18.	
Alpha	.75	.80	.75	.95	.75	.80	.60	.70
Alta	.30	.55	.25	.35	.20	.30		.20
Andes	.20	.35		.25		.20		.15
Argenta		.10						
Belcher			.55	.65		.55		.30
Belding								
Best & Belcher	1.00	1.10	1.00	1.25	.80	1.15	.80	.85
Bullion			.15	.25	.20	.30		
Bonanza King								
Belle Isle				.30		.25		.20
Bodie Con	2.55	3.15	2.40	2.80	2.10	2.70	1.80	2.10
Benton	.10	.15		.10		.05		.05
Bodie Tunnel								
Bulwer		.40		.30	.30	.50		.30
California		.10	.10	.15	.05	.35	.30	.35
Challenge				.15				.10
Champion								
Chollar	1.70	1.90	1.70	2.90	2.40	2.75	2.40	2.60
Confidence			.60	.70		.65		.50
Con. Imperial								
Con. Virginia		.10	.10	.15	.05	.35	.30	.35
Con. Pacific	.90	.95		.95	.90	.95	1.05	1.10
Crown Point	.75	.80	.75	.90	.65	.75	.60	.75
Day		.75				.75		.75
Eureka Con		2.90		2.75	2.40	2.50		2.40
Eureka Tunnel								
Exchequer	.13	.15	.15	.20	.10	.15	.10	.15
Grand Prize		.10	.05	.10		.10		
Gould & Curry	.50	1.05	1.00	1.30	1.00	1.25	1.05	1.15
Goodshaw				.05		.05		
Hale & Norcross	2.50	2.95	2.90	3.25	2.50	3.00	2.55	2.85
Holmes		3.70				3.75	4.05	4.00
Independence								
Julia								
Justice		.15		.15		.10	.10	.15
Martin White								
Mono	.65	1.35	.65	1.00	1.00	2.20	.95	1.30
Mexican	.45	.60	.45	.65	.20	.45	.20	.75
Mt. Diablo			3.75	3.90	3.80	3.95	3.70	4.00
Northern Belle								
Navajo	3.20	3.25	2.75	3.25	2.70	3.00	2.00	2.40
North Belle Isle	.35	.40	.30	.40	.20	.25		.25
Occidental		1.25		1.10		1.00	.70	.80
Ophir	.50	.55	.50	.60	.20	.50	.15	.70
Overman				.70		.10		
Potosi	.75	.90	.80	1.15	.85	1.10	.80	.90
Pinal Con								
Savage	.75	.85	.75	1.10	.70	1.00	.65	1.30
Seg. Belcher								
Sierra Nevada	.45	.90	1.00	1.20	.70	1.10	.70	.75
Silver Hill								
Silver King		5.25			5.50	5.75		
Scorpion		.10		.10	.05	.10		.05
Syndicate				.45	.40	.45		
Tioga								
Union Con	.45	.50	.45	.60	.30	.80	.60	.70
Utah		.30	.70	.85	.60	.80		.50
Yellow Jacket	1.15	1.20	1.05	1.15	.70	1.10	.70	1.10

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Dec. 18.

1400	Alta	20c	
50	Bodie Con	1.95	
100	Belle Isle	15c	
250	Chollar	2.55	
200	Con. Pacific	1.10	
75	Gould & Curry	1.15	
1750	Hale & Nor	2.80@2.90	
50	Mexican	70c	
1170	Mono	1.25@1.30	
300	Navajo	1.95	
100	Ophir	65c	
950	Potosi	90c	
100	Sierra Nevada	75c	
600	Savage	1.25@1.30	
150	Solid Silver	20c	
50	Union	65c	
100	Yellow Jacket	1.05	
	AFTERNOON SESSION.		
240	Alta	20c	
100	Alpha	70c	
850	Bodie	2.05@2.10	
280	B. & Belcher	80@85c	
550	Bulwer	30c	
300	Chollar	2.40@2.45	
1050	Con Va & Cal	35c	
50	Crown Point	60c	
100	Eureka Con	2.40	
100	Exchequer	10c	
200	Gould & Curry	1.10	
200	Hale & Nor	2.55	
50	Holmes	4.00	
800	Justice	10c	
1300	Mono	1.30	
350	Mexican	20@25c	
80	Mt. Diablo	4.00	
150	Navajo	2.50	
500	Ophir	20@25c	
180	Potosi	80@85c	
300	Solid Silver	10c	
250	Scorpion	05c	
150	Sierra Nevada	70@75c	
600	Savage	70c	
150	Union Con	65c	
120	Yellow Jacket	70c	

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Dec. 18, 1884.

ANTIMONY—Per pound		@	—
Hallet's		12½@	—
Cookson's		13½@	—
BORAX—Refined		7½@	8
IRON—Glengarnock ton		25 00 @	—
Eglinton, ton		24 00 @	—
American Soft, ton		25 50 @	—
Oregon Pig, ton		@	—
Clipper Cap, Nos. 1 to 4		@	—
Clay Lane White		22 00 @	—
Shotts, No. 1		26 00 @	—
Refined Bar		3 @	5½
Boiler, 1 to 4		5 00 @	5 50
Plate, 5 to 10		4½@	4¾
Nail Rod		7 @	—
Norway, according to thickness		6 @	7
STEEL—English, lb		15 @	25
Black Diamond, ordinary sizes		13 @	—
Drill		15 @	—
Machinery		12 @	14
COPPER—Ingot		14 @	15
Brazers' sizes		@	26
Fire-box sheets		28 @	—
Bolt		23 @	25
Yellow Metal		16 @	17
LEAD—Pig		3½@	3¾
Bar		5 @	—
Pipe		7 @	—
Sheet		8 @	—
Shot, discount 10% on 500 lbs bags. Drop, ¾ bag		1 85 @	—
Buck, ¾ bag		2 05 @	—
Chilled, do		2 25 @	—
TINPLATE—Oldcastle		5 25 @	6 00
Charcoal		5 75 @	6 75
Coke		5 25 @	6 50
Roofing		6 25 @	13 50
ZINC—German		9 @	10
Sheet, 7x3 lt, 7 to 10 lb, less the cask		9 @	10
QUICKSILVER—By the flask		36 00 @	—
Flasks, new		1 05 @	—
Flasks, old		85 @	—
NEW YORK PRICES—			
California Borax, refined		8½@	8¾
Pig Iron, American No. 1		19 50 @	20 00
Pig Iron, American No. 2		18 00 @	19 00
Quicksilver		48 @	50
Copper		11½@	—
Bar Silver		1 07 @	—

Market Reports.

Lumber at Wholesale.

The prices of lumber are fixed by the Association, but there is now so much "cutting under" that it is difficult to state any fixed price. Since the break in the Association which occurred recently, the prices have been much lowered from the figures given, which are, however, those agreed upon. Quotations of cargo rates are as follows for redwood lumber, for delivery at San Francisco, Oakland, Alameda, Berkeley, Vallejo, Benicia, Port Costa, Martinez and Antioch:

ROUGH—No. 1 rough merchantable, $18; No. 2 (refuse) rough, $14; No. 1 rough boards (specified width, 10 inches and over), $19; No. 2 (refuse) do do do, $14; No. 1 rough lumber, surface one side, $21; No. 2 (refuse) do do do $18.

PICKETS—Rough square pickets, $12; rough pointed do, $14; fancy pointed do, $22.

HALF-INCH LUMBER—No. 1 ½-inch surfaced, board measure, $40; No. 2 do do do, $30; No. 3 do do do, $38; No. 4 (refuse) do do do, $32; No. 1 ½-inch battens, board measure, $40; No. 2 (refuse) do do do, $32; No. 1 ½-inch siding, 12 ft. and over, b m, $40; No. 2 (refuse) do do do $32; ½-inch siding, under 12 ft, $32.

RUSTIC—No. 1 Rustic, 1x10, 12 ft and over, $33; No. 2 do do do, $32; No. 3 do do do, $31; No. 4 Rustic, 1x10, $28; No. 5 (refuse) do do do, $21; No. 1 Rustic, 1x8, 12 ft and over, $31; No. 2 do do do, $30; No. 3 do do do, $29; No. 4 Rustic, 1x8, $26; No. 5 (refuse) do do, $21.

CLEAR—No. 1 surfaced and rough clear, $32; No. 2 do do do, $31; No. 3 do do do, $30; No. 4 (refuse) do do do, $24; No. 1 surfaced and rough clear, 1x8 and 1x6, $30; No. 2, do do do, $29; No. 3 do do do, $28; No. 4 (refuse) do do do, $24.

[Dimensioned, Surfaced and Rough Clear (widths and lengths), 12 inches wide and over, add $1 ₱ M (on each corresponding grade) to the above list price of "Clear."]

TONGUED AND GROOVED—No. 1 T and G, 1x4, 12 feet and over, $32; No. 2 (refuse) do do do, $24; No. 1 T and G, 1x6, 12 ft and over, $30; No. 2 (refuse) do do do, $24; T and G, 1x6, 7 to 11 ft, $26; do do, under 7 ft, $23.

TONGUED, GROOVED AND BEADED—No. 1 T, G and Beaded, 1x4, 1¼x4 and 1¼x6, 12 ft and over, $32; No. 2 (refuse) do do do, $24; T, G and Beaded, 1x4, 1¼x4 and 1x6, 7 to 11 ft, $27; do do, under 7 ft, $22.

ROUGH CLEAR—1x6 and under in width, and under 12 ft in length, $24.

[On a credit of 60 days, or a discount at the rate of 1 per cent per month for anticipated payments, and not less than 1 per cent per month added for extension of the same].

We quote cargo rates—Pine—Merchantable Rough, $15 ₱ M; Flooring, $24.20; Stepping, $37 ₱ M; Redwood—Merchantable Rough, $18; Surfaced, $32; Rough Clear, $32; Rustic, $33; Tongued and Grooved, $30; Pongued, Grooved and Beaded, $32.

Lumber at Retail.

Retail quotations for pine, fir and spruce are as follows:

ROUGH MERCHANTABLE—(Ordinary sizes) to 40 feet long, per M ft, $22.50; Rough Merchantable, 1x6, Fencing, $22.50; do do, 1x4, do, $23.50; do do, 1x3, do, $24.50; do do, 1x4, odd lengths, $22.50; do do, 1x6, do $21.50; do No. 2, all sizes, $18.50; do Selected, $26.50; do Clear, other than for T and G and Stepping, $31.

[Rough Clear for T and G and Stepping $1 ₱ M less than price of kind for which intended.]

Dressed T and G Flooring, 1x6, No. 1, vertical grain, ₱ M ft, $38.50; Dressed T and G Flooring, 1x6, No. 1, $33.50; do do do, No. 2, $28.50; Dressed T and G Flooring, 1x3, 1x4, 1¼x4 and over, No. 1, vertical grain, $40.50; do do do, No. 1, $35.50; do do do, No. 2, $29.50; Dressed Stepping, No. 1, vertical grain, $42.50; do do, No. 1, $37.50; do do, No. 2, $28.50.

SPRUCE—Rough Merchantable, ₱ M ft, $21.50; do Clear, $35; Clear Dressed (shelving), $40; Pickets (rough) board measure, $20.50; Furring, 1x2, per lineal ft, 1c; Laths, 1 and 1-¼inch, ₱ M, $3.50; 1½-inch, $4.

[N. B.—For all sizes over 14 inches, and lengths over 40 feet, extra rates].

Retail quotations of Redwood are as follows:

ROUGH MERCHANTABLE—₱ M ft, $22.50; do Selected, $27.50; do No. 2, $18.50; Surface, No. 1 and Rough Clear, $40; do, 1x6, $37.50; do, No. 2, $30; Rustic, No. 1, 1x8, $37.50; do, No. 1, 1x10, $40; do, No. 2, $35; do, under 10 ft, $35; T and G Redwood, 1x4, 1¼x4 and 1¼x6, $40; do do, 6-inch, 12 ft and over, $37.50; do do do, 7 to 11 ft, $32.50; do do do, under 7 ft, $30; do do do, No. 2, $30; do do, Beaded, 12 ft and over, $40; do do do, 7 to 11 ft, $32.50; do do do, under 7 ft, $30; Half-inch Surface, $32.50; Pickets, Fancy, $30; do, Rough, pointed, $20; do do, square, $17.50; Siding, ¾-inch, $27.50; Battens, ¾-inch, perlineal ft, 1c; Shingles, ₱ M, $2.50; Shakes, Split, $24; do, Sawed, $12; Posts, per piece, 13c; Dressed Boards, ₱ M ft, $25.

On a credit of 60 days or less, or a discount of two (2) per cent for cash only. On all credits exceeding 60 days' time, not less than one (1) per cent per month to be added.

Under the rules of the Exchange, no "lump" sum will be given on any bill of lumber.

Nails.

The market is inactive and the prices appended might be shaded on large orders. We give the price list of the Pacific Iron and Nail Company.

FENCE AND BRAD.—10d to 60d, $2.75; 8d and 9d, $0.25; 6d and 7d, $0.50; 4d and 5d, $0.75; 3d, $1.50; 2d, $2.75. Fence, $0.25.

BARRELS.—⅝ inch, $6.00; ¾ inch, $3.00; 1 inch, $2.50; 1¼ inch, $1.75; 1½ inch, $1.50; 1¾ inch, $1.00; 1½ inch, $0.75.

LINING.—⅝ inch, $4.50; ¾ inch, $3.00.

TOBACCO.—10d, $0.50; 8d, $0.75; 6d to 7d, $1.00.

CLINCH.—6d to 30d, $1.75.

SLATING.—5d, $1.00; 4d, $1.00; 3d, $1.75; 2d, $3.00.

FINISHING.—2d, 1 inch, $6.00; 3d, 1¼ inch, $4.00; 4d, 1½ to 1¾ inch, $1.75; 6d, 2 inch, $1.50; 8d, 2½ inch, $1.25; 10d, 3 inch and over, $1.00.

CASING AND BOX.—10d to 30d, $0.75; 8d, $1.00; 6d, $1.25; 4d, $1.50; 3d, $2.50.

FINE BLUED.—4d, $1.75; 3d, $3.00; 2d, $3.75.

CUT SPIKES.—All sizes, $0.25.

BOAT SPIKES.—All sizes, $0.75.

Each half keg 10 cents extra.

TERMS.—Note or acceptance at 60 days with current rate of Exchange on S. F., or a discount of 2 per cent for cash, if remitted within 10 days from date of invoice.

All accounts when due subject to sight draft without notice.

An abatement of 10 cents per keg will be allowed upon orders of 200 kegs or over.

Building Material.

Lime, per barrel, $1.50@$1.60. Plaster, $2.75-3.00. Eastern Plaster, $3.00-3.25. Rosendale Cement, $2.25-2.75. Portland Cement, $3.50-3.75. Fire Brick, per 1,000, $40 @ $45, according to brand; hard, $16.00@$12,00; red, $8.00@$8.50; soft, $7.50; face, $30.00.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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Mining Share Market.

Prices continue very low for mining shares. The new departure in the north end mines of the Comstock, in abandoning the levels below the 2700 foot, which is more fully referred to elsewhere in these columns, really means the resumption of prospecting in ground hastily passed by years ago.

In all the mines at the north end they will now soon resume work at points where in sinking were left behind streaks of ore of more or less value. Some of these may have been cut in their widest part and may be of no value, but it may be found that others are the tail ends of deposits of workable width. The idea now is to go back and find out about these matters; also to work any ore that may be found for all it is worth. At the Ophir they will soon open up on the 500 level a large area of ground that ought to pay a good profit for working. This ground will be 200 feet in hight above the 500 level, and of a width of from 100 to 150 feet.

At the middle mines they will soon be in a situation to explore every foot of ground from the 3000 level to the surface. The new hydraulic pump at the 3000 level will make them masters of the situation. With that in operation there need be no fear of water, and drifts may be fearlessly run on any of the levels above.

At Gold Hill the leading mining companies are taking out the usual amount of low-grade ore. With them it has become a regular business, and soon the same thing will be seen at the north end mines. The Alta and Benton have been driven out of their lower levels by water, and will now resume explorations in ground passed by years ago.

Bullion Shipments.

King, Dec. 14, $7,383; Alhambra, 14, $9,559; Horn Silver, 9, $17 500; Vienna, 9, $1,875; Hanauer, 9, $9,800; Queen of the Hills, 9, $4,300; Hanauer, 10, $2,500; Crescent, 10, $2,400; Nevada, 10, $3,400; Horn Silver, 10, $7,500; Christy, 10, $11,600; Minnie Moore, 10, $1,236. Horn Silver, 11, $11,000; Vienna, 11, $1,860; Horn Silver, 12, $10,000; Christy, 12, $1,300; Hanauer, 13, $7,400; Queen of the Hills, 13, $1,350; Horn Silver, 13, $5,000; Honevine, 13, $4,000; Ontario, 13, $18,222; Horn Silver, 14, $5,000; Minnie Moore, 14, $1,250; Hanauer, 14, $2,500; Crescent, 14, $1,350; Queen of the Hills, 10, $1,500; Bodie, 8, $8,052; Navajo, 8, $15,000; Christy, 13, $9,982. The banks, Salt Lake City, report the receipt for the week ending December 10th, inclusive, of $109,985.30 in bullion, and $15,388 in ore; a total of $125,373.30.

USEFUL HOLIDAY PRESENTS FOR YOUNG AND OLD may be found at Muller's Optical Depot, 135 Montgomery St., near Bush, opposite the Occidental Hotel, San Francisco, as follows: Elegant Mercurial Barometers for Offices, Halls, Libraries, Hotels, Vessels, etc. Pocket Altitude Barometers for Mining Engineers. A full line of elegant Thermometers, Mining Compasses, Microscopes for Boys, from $1.00 to $10.00—something more costly and suitable for a Doctor's Office, both useful and ornamental. Opera, Field and Marine Glasses, Drawing Sets, Fine Gold Pebble Spectacles and Eye Glasses expressly made for the Holidays. Great pains taken in selecting Spectacles or Eye Glasses to be sent away for Christmas.

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S. F. VISITOR'S DIRECTORY.

For the convenient reference of our readers, and benefit of visitors to S. F. from the interior and abroad, we shall occasionally insert the following directory free. Officers of associations mentioned are invited to notify us promptly of any changes occurring from time to time.

California Academy of Sciences.

Hall and museum, S. W. corner California and Dupont. President, Prof. GEORGE DAVIDSON; Secretary, CHARLES G. YALE. Regular meetings, 1st and 3d Mondays of each month. Museum open to the public from 9 A. M. to 5 P. M. on Mondays, Wednesdays and Saturdays. Museum embraces all classes of natural history specimens.

Crocker-Stanford Collection

This collection was presented to the California Academy of Sciences by Charles Crocker and Leland Stanford. It comprises a large number of specimens of minerals, casts and articles in all branches of natural history. Among other things are many of Ward's casts, including the monster elephants, mammals, etc. The collection is on exhibition at Mercantile Library Hall, 214 Bush St., and is open to the public every Saturday from 10 A. M. to 2 P. M. Chas. D. Gildes, curator.

California Pharmaceutical Society.

Lectures are given at the hall of the College of Pharmacy Fulton street, between Polk and Van Ness avenue, three nights each week, for a term of six months, in the summer.

California State Geological Society.

Henry G. Hanks, President; S. Heydenfeldt, Jr., Secretary. Headquarters, State Mining Bureau, 212 Sutter St.

Geographical Society of the Pacific.

Rooms, 413 Sutter St. President, George Davidson; Secretary, C. Mitchell Grant. Meetings, 1st and 3d Tuesdays of each month.

California State Mining Bureau.

Office and museum, 212 Sutter St. State Mineralogist, Henry G. Hanks. Open daily to visitors free, from 10 A. M. to 3 P. M. Museum comprises ores, minerals, rocks and natural products of the State.

Mechanics' Institute.

Rooms and library, 31 Post St. P. B. Cornwall, President; W. P. Stout, Recording Secretary; Horace Wilson, Librarian.

People's Free Library.

Location, north side of Bush, between Kearny and Dupont. Librarian, Fred B. Perkins. Open from 9 A. M. to 9 P. M.

Mercantile Library Association.

Library, 214 218 Bush. A. E. Whitaker, Librarian. There are 52,000 volumes in the library. Reading room, with papers and magazines.

Technical Society of the Pacific Coast.

Hall, 413 St. President, Col. Geo. H. Mendell, U. S. A.; Secretary, Charles G. Yale. Regular meeting, first Friday of each month; extra meeting for discussion of papers, last Friday of each month.

Society of California Pioneers.

Rooms, 808 Montgomery St. President, Nathaniel Holland; Secretary, F. Vassault. There is a library cabinet of minerals, relics of early times, and other objects of interest at the rooms. Regular meetings, first Monday of each month.

San Francisco Microecopical Society.

Rooms, 120 Sutter St. President, C. Mason Kinne; Secretary, E. J. Wickson. Meetings, second and fourth Wednesdays of each month.

University of California.

Location, Berkeley. Museum comprises the collection of the State Geographical Survey, the Floche and Keene collections, and a large miscellaneous collection of the woods, ores, minerals, rocks, etc., of the Pacific Coast.

Golden Gate Park.

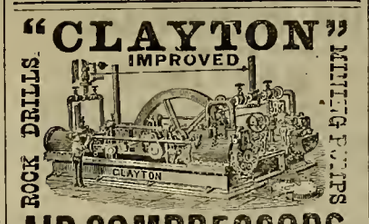
The Park may be reached directly by cable cars of the Haight St. or McAllister St. line, which run out Market and branch off at the streets named, for the Park, or by the Geary St. line. The Park is opened for visitors at all times.

Woodward's Gardens.

Mission St., between 13th and 14th. Reached by Folsom, Mission, Howard and Market St. cars. In the gardens are menagerie, museum; art gallery, aviary, aquarium, theatre, restaurant etc.

At the World's Fair.

Back numbers and the latest files of this paper will be found in the California Department, and also in the Newspaper Exchange Department, of the World's Fair, New Orleans. Mr. W. H. Jessup, of the horticultural section of the California Department, can be consulted on business terms for this office, extra copies, etc.



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The World's Industrial and Cotton Centennial Exposition

Will be open for Six Months, beginning 16th day of December, 1884.

The display will embrace such a varied and comprehensive collection of the works of nature and art as it is possible for human enterprise to gather.

From the applications already received and entries made, the magnitude of the exhibit will exceed that of any Exposition ever held.

The exhibits of the Departments of the General Government, for which $300,000 was appropriated by Congress, will be the largest and most complete ever made. These exhibits, in conjunction with the State and Territorial Collective Exhibits and Educational display, will occupy the full space of the second largest building of the Exposition—one of the very largest ever erected—885 feet by 505 feet.

The displays in the Horticultural department, in Agriculture and in the Live Stock department, will be of equal, if not greater, magnitude than if separate and distinctive exhibitions were given.

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In the line of Manufactures and Arts, and in natural products, the Exposition will be memorable excelling all previous efforts.

The principal structures of the Exposition are:

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The U. S. and State Exhibits, 885x505 feet.

The Horticultural Hall, 600 feet long by 194 feet wide, in center.

The Art Gallery, 250x100 feet.

The Mexican National Exhibit, Octagonal, 80 feet cross section.

The Mexican National Headquarters, 300x190.

The Grand Rapids (Mich.) Furniture Pavilion, 172x172 feet.

Saw Mill Buildings, 600 feet long.

Live Stock Quarters and various other minor Buildings.

The Exposition grounds lie between St. Charles Avenue and the left bank of the Mississippi River. They are reached by five different lines of street railways, two of steam, and by all classes of water transportation.

Accommodations for fifty thousand transient people have been listed—rates and character determined and recorded. The prices will range from one to three dollars per day, according to the character of accommodation provided.

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ASSESSMENT NOTICE.

The Eureka Gas Company.—Location of principal place of business, San Francisco, Cal. Location of works, Eureka, Humboldt county, Cal.

NOTICE is hereby given that at a meeting of the Board of Directors, held on Wednesday the third day of December, 1884, an assessment (No. 1) of one dollar per share was levied on the capital stock of the corporation, payable immediately in United States gold coin to the Secretary at the office of the company, 302 Pine St., San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on Wednesday the fourteenth day of January, 1885, will be delinquent, and advertised for sale at public auction, and unless payment be made before, will be sold on Monday the second day of February, 1885, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

C. S. BACHELDER, Sec'y.

OFFICE—302 Pine St., San Francisco, Cal.

ASSESSMENT NOTICE.

Gould and Curry Silver Mining Company.

ASSESSMENT No. 40.

Levied	October 25, 1884
Delinquent	November 20, 1884
Day of Sale	December 22, 1884
Amount	Fifty cents per share.

ALFRED K. DURBROW, Secretary.

OFFICE—Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

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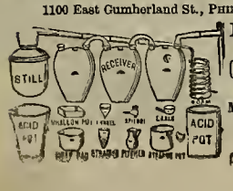

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Scientific Press **Patent Agency.**

[ESTABLISHED 1860.]

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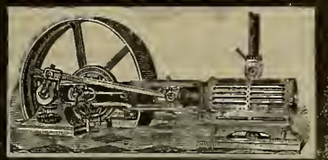

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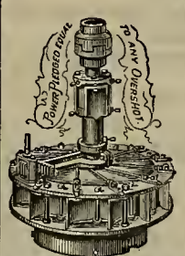

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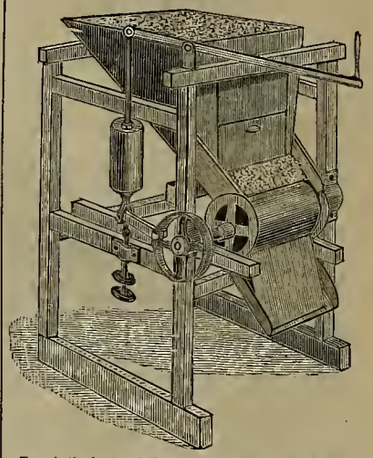

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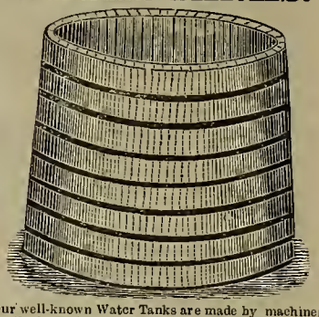

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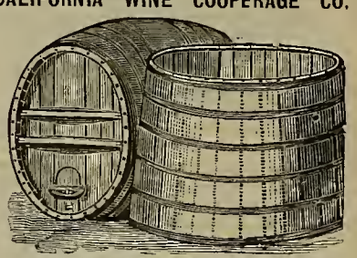

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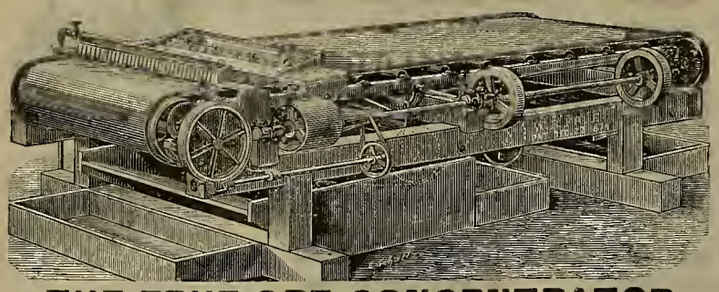

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As the result of a suit East against an End-Shake Machine (the Embrey), similar to the Triumph, the Frue Vanning Machine Company owns the Embrey patent, and can put in the market an End-Shake Machine of earlier patent that will do as good work as the Triumph, and superior in construction and durability. There will be no risk of suit for infringement.

The Frue Vanning Machine Company warn the public that they claim and will prove the Triumph machine to be an infringement on patents owned by them.

Protected by patents May 4, 1869, Dec. 22, 1874, Sept. 2, 1879, April 27, 1880, March 22, 1881, Feb. 20, 1883, Sept. 18, 1883. Patents applied for.

N. B.—We are and have been ready at any time to make a competitive trial against the Triumph, or any other Concentrator for stakes of $1,000.

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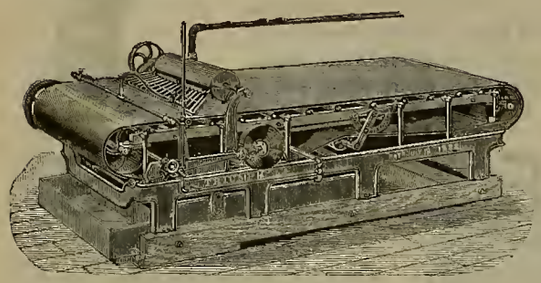

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THE "TRIUMPH" TRIUMPHANT!

In a competitive trial recently had between two of the **"Triumph" Ore Concentrators** and the same number of **"Frue" Vanning Machines**, at the mill of the celebrated gold producing Original Empire Mill and Mining Company, in Grass Valley, Nevada County, Cal., the "Triumphs" produced thirteen and fifteen one-hundredths (13.15) per cent more concentrations than did the "Frue" Vanners, during a run of twenty-four consecutive days, or a net gold coin result of $199.15, or $8.30 per day, in favor of the two "Triumph" Concentrators.

These returns do not include the value of the amalgam saved by the "Triumphs" during the test; which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarily saved, which is lost on the "Frue" Vanners.

This trial was conducted under the personal supervision of the Manager and Superintendent of that Company, in a strictly fair and impartial manner, and with the sole view of determining, in the interest of that Company, the merits and demerits of the respective machines by a thoroughly practical test. A relation of the course of procedure, a concise analysis of assays, and a tabulated statement of the net bullion results, with accurate deductions therefrom, will soon be published in Circular form.

The superiority of the present construction of the "Triumph" over the form originally introduced, together with the demonstrated results of the above, and other trials had with the "Frue" Vanners, induce us to and **we hereby accept the Challenge of $1,000**, flaunted by the Agents of the "Frue Vanning Machine Company," and hold ourselves in readiness to enter into a second competitive trial for that sum, at such place and upon such terms and conditions as may hereafter be mutually arranged.

We guarantee purchasers against all costs, expenses or charges incurred by reason of any infringements of any existing patents.

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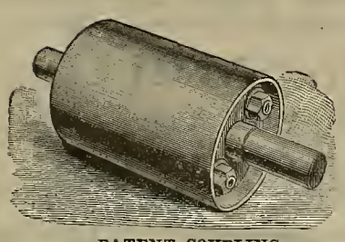

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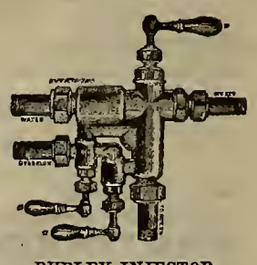

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SAN FRANCISCO, SATURDAY, DECEMBER 27, 1884.

VOLUME XLIX Number 26.

EXHIBIT MADE AT THE CALIFORNIA STATE FAIR BY HUNTINGTON, HOPKINS & CO.,

For which the Society awarded a special gold medal as the most attractive display.—See page 405.

Calaveras County Resources.

"The Lands, Mines, etc. of a Foothill County."

From the letter of a correspondent of the *Placer Herald* we make the following extracts concerning the resources of Calaveras county:

The pleasant visit of a few weeks, which the writer made at "West Point" and neighborhood, is the immediate cause of this communication. The people of this region enjoy supreme health, and of consequence are social, hospitable and jovial. The social status of the neighborhood commends itself to those seeking permanent abodes. The altitude is such as to give a pleasant temperature summer and winter. The heat is never intense in summer, the snow never falls more than six inches in winter and is soon melted by the sun. The soil is of red cast and highly impregnated with iron and yields abundantly. The cereals are not so extensively cultivated as the grasses, but I was told that oats, wheat and rye did well. Alfalfa, red clover and timothy flourish luxuriantly. The orchards yield abundantly, and the fruit is as finely flavored as any I have ever tasted. Apples, plums, pears and quinces grow to perfection, and some of the finest varieties have been cultivated. Grapes have only recently attracted attention, but there are now large vineyards and bearing abundantly. The gardens are also worthy of notice; potatoes, cabages, beets, pumpkins, squashes and cucumbers do as well as the most fastidious could desire.

There is no better country for stock in the State than the region about "West Point." The climate and the grasses are of the best for horses, horned cattle and sheep. I also saw some fine hogs. In addition to all this, there is a large amount of

Vacant Government Land

Within a few miles of the village. It is situated on the headwaters of the Mokelumne River, and the country is well watered and well timbered. At present the great disadvantage is want of means of transportation to carry the products of the soil to market, but this objection will soon be removed, as railroads are building and are now within 30 miles of the village. To compensate for this want of a foreign market, there has been and is likely to again be a home market for all the farm or garden products that can be raised. This home market arises from the wants of the miners of the district. The mining district bears the same name of the town, and some years ago a flourishing camp in which a large amount of gold was taken from the surface.

This is a Peculiar District.

All the gold was obtained from quartz, contained in the red earth or clay on top of the rock. This earth is from 30 to 70 feet deep and overlies a granite or porphyry bed-rock. The original mines were worked by Spaniards, Mexicans and Italians, who would find a quartz seam often very rich and would follow the seam down until it entered the hard bed-rock which they termed the water level. These seams were generally from 12 to 20 or 30 feet wide. The quartz was not hard to crush and yielded from $40 to $134 per ton. They crushed the metal with arastras turned by water, horse and mule power. The gold was generally free and easily extracted and readily amalgamated. Another singular feature was that down to the water level these seams went in a zigzag form. These primitive miners did not go into the hard rock because of water and greater labor, but many of the hills are honey-combed with holes sunk on these seams. The Mansel Hill and Valentine Hill have holes sunk upon them every few rods all over them. There are hundreds of them, and it is said they nearly all paid richly.

The Modern Miners

Have followed these ledges into the hard rock or below the water level only in a few instances, but where they have gone down they find the rock as rich as above, but much harder to extract.

When the writer was there a few days since, a number of companies were actively engaged in sinking and crushing the quartz taken out. There is some base metal to contend with, and this fact has induced a company of San Francisco capitalists to put up a furnace under the direction of Dr. Russell, and upon a plan for which I believe he has taken out a patent. The company is taking out a large amount of quartz and are about ready to commence roasting and crushing.

Messrs. Jenkins and Roe have a ten-stamp mill and are working their ledge, which yields $38 to $40 per ton. They have a mill with all the modern appliances, crusher, well copper-lined battery, copper-plated sluices, three pans used for amalgamating, and revolving blankets to save the sulphurets. Messrs. Richardson & Co. have a mill of ten stamps on a lead about two-and-a-half miles from West Point.

Mining Facilities.

In looking at the district I was struck with the facility with which the lodes might be worked, on account of the close proximity of the ledges. To illustrate: Take Valentine Hill, which seems the central or highest crown of the district. A company on this hill, called the John Henry Gold and Silver Mining Company, have a shaft down about 125 feet, about 35 feet into the hard rock; it is composed chiefly of gentlemen of Sacramento city. This company has a double compartment shaft and hoisting works with good engine, and intend sinking 100 feet further before stoping out upon the ledge. Now, this company, when 100 feet lower, can, by running cross drifts one to two hundred feet on each side, work three ledges on either side of them, in addition to their own. Mansel and other hills are situated in the same way; that is, the ledges run in groups, and a number can be worked from one shaft. The John Henry mine has yielded some very rich ore; when I was there they were taking out metal worth $50 per ton. The ledge was about 30 inches wide. This company have had a number of assays away up in the hundreds, but a working pulp assay gave them $50 per ton.

Another Great Advantage this District

Possesses, the miner can have his homestead. He can improve his farm when not engaged in mining; if his mine should fail he has his farm, where he can live in comfort. Tois is no idle dream. Several persons there are thus situated. I met Mr. Sterling, who has a farm of 160 acres, a fine large dwelling, fine orchard, good stock and plenty of feed, and a good-paying ledge, from which he is still taking out rich ore. He crushed his ore in his own arastra, run by water power.

Capitalists are alive to the importance of this district. A number of old locations have been relocated within two months, some purchases made, and much activity is predicted. I might add, that by the Calaveras *Chronicle* of September 20th, some eight persons give notice of their intent to make "final proof" of their land claims for homes.

In an experience of a quarter of a century of active mining, I have not noticed a more favorable point for profitable investment of capital and labor. It does not take fortunes to operate in this district, which it does in most others. The facilities are certainly great. To the industrious poor man an opening is here offered, and to the enterprising capitalists no better chance could be presented than in "West Point District."

Annual Expenditure.

Although the average prospector aims to acquire that knowledge of the law which most particularly concerns his interests, he is liable to get "rusty" on some points, however common, and we reproduce the following extract from section 2324 of Revised Statutes for their benefit in general, and the benefit of those whose errors have in several cases led them to pursue a wrong course in "advertising out," etc.:

Said section is amended to read as follows: "The period within which the work required to be done annually on all unpatented mineral claims shall commence on the first day of January succeeding the date of location of such claim, and this section shall apply to all claims located since the 10th day of May, 1872. Where such claims are held in common, such expenditure may be made on any claim; and upon a failure to comply with these conditions the claim or mine upon which such expenditure occurred shall be opened to relocation in the same manner as if no location of the same had ever been made, provided that the original locators, their heirs, assigns or legal representatives have not resumed work upon the claim after failure and before such location. Upon the failure of any one of several co-owners to contribute his proportion of the expenditures required hereby, the co-owners who have performed the labor or made the improvements, may, at the expiration of the year, give such delinquent co-owner of personal notice in writing, or notice of publication in the newspaper nearest the claim, for at least once a week for ninety days, and if, at the expiration of ninety days after such notice in writing or by publication, such delinquent should fail or refuse to contribute his proportion of the expenditure required by this section, his interest in the claim shall become the property of his co-owners who have made the required expenditure.

THE ASSESSMENT RUSTLER.—An exchange says: This week we propose to notice the assessment rustler. He is in every camp, generally a pretty keen man. He keeps his eyes open and knows all the claims in the camp. He corresponds with absent owners, and gets the job of doing their assessment work. For convenience we call him A and his partner B. A, by good rustling, gets the assessments to work on fifty or sixty claims. He goes with his partner B to the claim. They select a good soft spot, easily worked, and A lets B the contract at a price that, to people unacquainted with the ground, seems reasonable. Now B hardly ever touches a pick or drill, but he keeps a few miners ready to commence work. As soon as A gives him the contract B sets a few men at work. They invariably complete the assessment in from three to five days, giving A and B, after paying all expenses, not less than $50 on each claim. B makes the necessary affidavits, and A forwards them to the owners, who forward their $100. B pays the men who did the work $30 or $40, and the balance they divide between them, making on fifty or sixty claims a nice stake. This, we consider, the most pernicious of all swindles, for the owners honestly pay their money, expecting that a legal assessment has been done, when, in fact, they might just as well have allowed their claim to have been unworked, as far as protection from relocation is concerned.

Metallurgical Terms.

The Denver *Tribune-Republican*: A correspondent in the Bonanza *Enterprise*, asks and answers some questions in a readable manner:

"How is it that every newspaper writer in Colorado is continually repeating the extravagant error they do in relation to ore treatment and processes? I bardly ever take up a newspaper, but come across the passages 'Lead for fluxing.' 'The low-grade ores will always be used for flux.' The ores of this camp carry lead enough to flux themselves,' etc. I would think that as there are so many works for the treatment of ores, that writers ought to be a little better informed. Let me say to them: Gentlemen, lead is not used as a flux.

When smelters buy lead ores, it is not for flux, but for the lead as a metal to be saved in smelting, and not wasted as a flux. In smelting for gold and silver, there are two general methods employed. One, and the most common one, is to smelt into crude bullion, or rich lead. The lead, gold and silver, are all marketed. Many works in Colorado sell their rich lead to refiners in the East. Some separate gold and silver from the lead, and market each separately. It is a general practice to mix other ores with lead ores, for the purpose of collecting the gold and silver from them. In such a case, the lead is used as a recipient of the gold and silver from them all. In this case, the lead is not a flux, for care is taken to mix the ores so as to prevent any loss of lead. Such works as Grant's, Golden, the Omaha Works, practice this method.

The Argo Works adopt the plan of smelting into matte and use no lead. Their aim is to collect all gold and silver in a sulphide of copper, technically called copper matte. This is generally called the Swansea process, having had its origin and best developments there. It is suited to the treatment of ores carrying the precious metals and no lead, such as the pyrites ores of Gilpin county, and what are called dry ores. In fact, every ore can be treated except heavy lead ore. From this, it will be seen, that in neither case is lead used as a flux.

We understand by the term "flux" something added to make a fluid—to combine with the infusible parts to form a fluid slag. Thus, we conclude that lead is used for collecting precious metals, and is sought as a metal and not as a flux.

Now, as to processes; the newspapers are continually telling us of the grand revolution about to take place in the treatment of ores. One, they say is going to smelt for $3 per ton, another for $5, another even for $1, yet, everyone acquainted with the matter, is aware that the receiving, sampling and assaying, will exceed such a figure. One of the most recent of these processes put forth with such an idea, is the Jumbo smelter of Gunnison City, and yet, the same paper in which this flourish about the Jumbo process appears, shows the charges to be from $17 to $58 per ton. Every sensible miner smiles at such statements, and is sick of all process twaddle. He knows that in all large works, such as the Golden, the Argo, the Grant and the Pueblo, the strictest science is brought to bear upon the operations, and that the keen competition among them insures him all he can expect for his ore. The treatment of ore in Colorado, is as perfect as possible, and cost is simply freight, wages and fuel. When these decline, the price of ore may rise. The new process man is always a man totally ignorant of the business. When any well-known practical man of long experience, comes forward with a process, we will listen attentively.

HIGH PRICES FOR PROSPECTS.—Eastern capital is already beginning to make inquiries for paying investments in Arizona. Several gentlemen in this city have within the past several days received letters to that effect. One party, writing from Cleveland, Ohio, says: "If you can show us anything better than three per cent bonds we will gladly take it. This same gentleman had previously written that neither himself nor friends wanted anything to do with Arizona; now, however, as his letter indicates, they await only a favorable opportunity for investment. Several other letters seen by the writer were of the same tenor. One, however, to a mining man in this city, strikes a different key. He says in substance that much idle money is waiting for investment in Arizona mines, but is deharred hy the enormous prices at which said mines are held. If, he said, Arizona mines will come down to a fair valuation of their properties, they can sell them, but the time has gone by when prospect holes will bring fabulous prices. Worthless mines are not wanted under any consideration, but good ones will be much sought. Let the miners of Pima county give heed to the complaint, and ask only a fair valuation; they will benefit not only themselves, but the entire Territory. If the fabulous priced system he adhered to, no sales will be made, and the mining industry of Arizona with but few exceptions will not thrive. The writer has a case in point where $10,000 was offered for a prospect in which he was interested, but the price asked was $30,000, and his co-partners would take no less. The property was not sold, its selling qualities were dug out when working the next assessment, and the year following it was abandoned.—*Star.*

GOVERNMENT management of railways is not very successful in France, and there is talk of selling the roads to companies.

Yield of Comstock Mines.

The report of the county assessor is pretty good authority on this point. He gives the gross yield of the Comstock mines and mills for the quarter ending September 30th at $689,142. The cost of producing this bullion was $711,725. Of course there is no profit in the business on that basis, and yet those most interested in the operations of these mines manage to get a profit out of them by ownership in the mills that crush the ore. Mills are not generally run at a loss. There is a fixed price for crushing, which is supposed to be remunerative, and if the ore does not yield sufficient bullion to cover this expense, the difference is made up by assessing stockholders. In the last quarterly statement of the Comstock mines, Yellow Jacket is credited with the largest yield. The ore from this mine averaged an assay of $14.50 per ton, yielding $214,964, yet this product cost $230,779. The Crown Point produced $123,498 from ore assaying $11.23 per ton at a cost of $118,219. Belcher had $13 ore and produced $112,706, at a cost of $108,703. The next beaviest yield was $87,509 by the Hale & Norcross at a cost of $89,003 from $13.25 ore.

We have not the figures showing the yield of the Comstock mines for the second quarter this year. The total for the first quarter was $588,403. Allowing $600,000 for the second quarter, gives a total of $1,877,500 for the first nine months of 1884. This compares as follows with the yield for previous years:

January 1st to September 30, 1881	$972,000
January 1st to September 30, 1882	1,134,000
January 1st to September 30, 1883	1,402,000
January 1st to September 30, 1884	1,877,000

On their face these statistics look rather encouraging. There has been a steady gain in the yield since 1880. The total this year to October 1st is nearly 100 per cent larger than it was in 1881. It is evident that the Comstock mines will not he abandoned so long as they yield from $1,000,000 to $2,000,000 per annum, and stockholders can be found willing to pay the difference hetween the yield and the cost of production. It is to be noted that most of the bullion this year has come from the Gold Hill mines and from ore previously passed hy in the upper levels. The Belcher, Crown Point, Kentuck and Yellow Jacket produced $529,700 of the $588,400 in the first quarter this year, and $489,400 of the $689,100 in the third quarter. It is prohable that there is still a good deal of low-grade ore in the upper levels of the north end mines.

WORK AT CALICO.—The late rainstorm, notwithstanding it reached a fall of a full inch upon a level over this district in a single night, with a closing drizzle on Tuesday night of nearly half the depth, making the atmosphere utterly disagreeable and cheerless, the work at the various mines kept in progress, and the resounding blast and click of pick and shovel in assessment work for miles around were to he heard from every point of the compass. Never before has there heen so much prompt energy displayed in doing assessment work upon every claim in the district as during this month. The surprising output of the mines heing systematically worked, the paying results to "chloriders" working on leases everywhere, the "big" promises of new finds, the undoubted developments of well-defined ledges of unknown depth, possessing clean cut walls, where Eastern and Old-World experts had pronounced permanent lodes an impossibility, has given confidence even to the doubting and hesitating, and to-day the Calico mining district is the most prosperous and prominent silver mining district on the Pacific Coast. The town itself, inconceivably awkward, miserable and repulsive as its location is, gives evidence of the substantial thrift and prosperity of the district. Two large new two-story hotels will he completed and ready for guests the coming week, and other improvements and accessions of an industrious population are visible throughout the camp. A supreme confidence is evident in the tone of conversations heard in town and in the various camps.—*Calico Print.*

A GRADUAL REDUCTION OF WAGES.—The Pioche *Record* says: The price of lahor is being gradually reduced throughout Utah. At Silver Reef the miner is receiving hut $3 per day for his lahor, and the pay of the engineer and mechanic has also been reduced. The Frisco Mining and Smelting Company, of Friseo, have notified the men employed in the Carhonate mine, in Champion district, and the Cave mine, in Bradshaw district, that on and after December 1st next, the wages of miners employed hy that company will he lowered to $3 per day. There seems to be a move throughout the whole of the inter-mountain country tending to the reduction of the price paid lahor of all kinds, and it is gradually heing accomplished. To-day, in Nevada, there are several camps where the miner receives but $3.50 per day for his lahor. This reduction of wages is inevitahle. It is bound to come, and all can plainly see that it is not far distant. Of course, everybody is opposed to the reduction—the merchant, the butcher—for all are aware that the higher wages are and the more plentiful is the supply of money, the hetter is the price the storekeeper receives for his goods. But the question is, "Can the mining companies exist under the present scale of prices that they have heen paying for the past twelve years?" It is doubtful in our mind if the companies can stand it.

MECHANICAL PROGRESS.

English and American Wood Workers Compared.

A well known American writer on mechanical subjects, Mr. Joshua Rose, who is now traveling in England, writes to the *Blacksmith and Wheelwright* as follows:

I have been at some little pains during my visit to this country to examine the quality of its workmanship, divesting myself as far as possible (and, of course, I believe, completely), of whatever prejudices my association with American workshops may have given me. My observations have, so far, been directed to such wood work as one finds in his ordinary travels by boat and rail, and in the houses of the middle and working classes. They have also been influenced by a simple desire for information, and not by any wish to draw invidious comparisons, but one cannot help making comparisons, and ultimately finds himself saying, "This is better and that is worse done than on the other side of the Atlantic."

The very first thing that strikes one here is that in whatever way the roughing out or preparatory stages of the work may be done, the finishing is executed by hand, and it is well done. You will not find saw marks in the corners nor tool marks in the crevices; it is one plain, smooth surface. In the second place the finish is a smooth polish, not a mere varnish. In these two points work of an equal quality in all other respects is undoubtedly superior in England. Before I left New York I closely examined an $80 suit of parlor furniture, a $30 bedstead and a $35 bureau, and candor compels me to admit that their finish does not compare favorably with a similar suit made in London at about half the price. Bear in mind that I am not saying anything about the style, and I am under the impression, so far as I have observed, that at an equal price the American is much superior to the English style, and when you come to take into account the difference in the value of money as measured by its purchasing power in the two countries, this is saying a good deal.

English work seems very well put together, for even in old work the joints seem to keep well closed and firm. There is one thing, however, to be noticed in this respect, and it is that the damp English atmosphere is a great element in the preservation of the joiner's work.

The wheels of all English vehicles are much more massive in every respect than those in the United States, which is the more to be wondered at when it is considered how vastly superior English roads are to the American. The only cobble stone roads I have yet seen here are at Whitehaven, in Cumberland, and they are exceedingly strong examples of an abominable idea. In London the roads are either asphalt or wood, beautifully level, and yet the wheels even of the finest carriages are clumsily heavy when you compare them to American work, and I fancy that even the Columbus Buggy Company would have to go under if they were compelled to put as much useless timber into their wheels as is customary here.

Decline of Water Power and Advance of Steam Power.

An interesting and highly suggestive phenomenon in the industrial progress of this country is the relative decline in the amount of water power as compared with steam power utilized for business purposes. This tendency is all the more suggestive by reason of the fact that no other country in the world is as well endowed with natural water power as the United States. Manufacturing enterprises usually seek water power in a new country, because of its cheapness and availability, but when all the valuable powers have been absorbed by those who have determined to get a steady revenue from them, neither of these two features of original desirability stand forth with much allurement. As water powers are improved they become *more* costly to the users; as steam power is improved it becomes *less* costly to the users.

In 1870 the census showed that there were more water wheels in use than steam engines, and that their horse-power was almost as much as the total horse-power of the engines. The census of 1880, however, showed more steam engines than water wheels, and a total power far in excess of the latter.

During the four years since the census was taken the progress of steam power has been greater than in any other four years of our history. What a census would now show as the relative decline of water power to be, or what the next census will show it to be, can be imagined after a study of the above census facts.

The reasons for the great advance of steam power are not difficult to discover. Water power is not as reliable as it was before the forests were thinned out or cleared away, while owing to improvements to engines and boilers, steam power is more reliable. Severe droughts and heavy floods have both operated to set at naught the business calculations of those dependent upon water power, while winter freezes and floating debris contribute to the annoyance and damage. The cost of dams is sometimes considerable. It is proposed to build a new one at Holyoke, to cost a million dollars, or a million and a half. The expense of land overflowed is often a large item in the cost of water power. As land becomes more valuable the cost of water power must increase. The application of power in industrial operations increases in a greater rate than the number of hands employed as shown by census returns, and the demand for steam engines and boilers is one that must inevitably keep pace with the development of the industrial resources of the country. It is a demand that has assumed elements of permanency.—*American Machinist.*

A Sheet of Letter Paper May Move a Ton One Mile.

Notwithstanding the acknowledged imperfections in our appliances for utilizing the full amount of energy which is due to the combustion of coal, the great improvements in that direction, which have been made during the past quarter of a century are really remarkable. Take for instance the modern cargo steamer which has now become a wonderfully economical freight carrier, especially as regards consumption of fuel. A freight train run under the most favorable conditions seems wasteful in comparison. The *Burgos*, a modern steamer especially built to carry cargo cheaply at a slow speed, lately left England for China with a cargo weighing 5,600,000 pounds. During the first part of the voyage, from Plymouth to Alexandria, the consumption of coal was 282,240 pounds, the distance being 3,380 miles. The consumption per mile was therefore only 83.5 pounds, and the consumption per ton of cargo per mile 0.028 pound. In other words, half an ounce of coal propell one ton of cargo one mile. Assuming that paper is as efficient a fuel as coal, we have, says the *Railroad Gazette*, only to burn a letter on board this steamer to generate and utilize enough energy to transport one ton of freight one mile. It is difficult to realize that such a trifling act as burning a letter involves such a waste of useful energy, or can have any reference to the energy sufficient to perform a feat which, under less favorable circumstances, requires a couple of horses and a teamster for about half an hour.

The best locomotive performance in this country of which we can find any authentic record gives a consumption of about two ounces of coal per ton of freight hauled one mile, at the rate of thirteen miles an hour, including stoppages. On lines having grades of from 53 to 70 feet per mile, the consumption often rises to five or more ounces of coal per ton of freight hauled one mile.

The engines of the *Burgos* are on what is termed the triple compound system, the steam being expanded in three cylinders in succession. The boiler pressure is 160 pounds per square inch. The average speed at sea in all weather is very nearly ten miles an hour.

Good Mortar.

Machinists and engineers who use mortar will value the appended information: Good mortar is a solid silicate of lime, that is, the lime unites with the silicia or sand to form a silicate of lime. In ancient days those who had some conception of the way the two things united superintended their mixing, but nowadays anybody is supposed to know how to make mortar, while nobody knows much about it. Dry lime and dry sand laid together or mixed and kept dry for a thousand years would not unite to form silicate of lime any more than acetic acid and carbonate of soda dry in a bottle would effervesce. To make silicate of lime just as good as was made by the Romans, all that is necessary is to proceed intelligently: Procure good caustic, *i. e.*, fresh-burned lime, and if you find it all powder, *i. e.*, air-slaked, don't use it; use only clear lumps. Slack this (if possible in a covered vessel), using only enough water to cause the lime to form a powder. To this while hot add clean sand, not dirt and loam called sand, but sand, and with the sand add enough water to form a paste. Then let it lie where it will not become dry by evaporation—in a cellar, so much the better, for as soon as you have mixed the sand and lime as above, they begin to react one on the other, and if not stopped by being deprived of moisture will go on reacting until silicate of lime (as hard as any silicate of lime ever was) is formed. But, if you take this so-called mortar as soon as made and lay bricks with it, unless the bricks are thoroughly wet you stop the formation of silicate of lime, and might as well lay your bricks in mud. Lime and sand, after being mixed, might lie two years with advantage, and for certain uses, such as boiler setting, or where the whole structure of brick and mortar is to be dried, the mortar ought to be mixed for one year before use, and two would be better; but for house building, if the bricks are so wetted as not to rob the mortar of its moisture as soon as used. Mortar that has been mixed a month will soon form good solid silicate of lime among the bricks it is laid with, in ten years, and will be still harder in a hundred years. The practice of mixing mortar in the street and using it at once is as foolish as it is ignorant, and would be no improvement. Silicate of lime is made only by the slow action of caustic lime and sand, one on the other, under the influence of moisture. Dry they will never unite, and mixing mortar as now mixed and using it at once, so as to dry it out and stop the formation that the mixing induced, is wrong.

SCIENTIFIC PROGRESS.

Appearance of a Tornado.

As the tornado sweeps onward in its course, it rises and falls with a series of bounds, and with a swaying motion, describing a zigzag course, now making a chain of loops, and again shooting off at an obtuse angle, varying in the speed of its forward motion, which may be anywhere from ten to thirty miles an hour. At the same time it is rapidly whirling on its axis in the opposite direction from a screw, or the hands of a clock, the air revolving around the vortex necessarily attaining a speed of several hundred miles an hour. First widening, then contracting, now bounding above the tree tops, and again descending to sweep the earth bare of every object within its reach, the aerial monster surges onward. The largest forest trees, mere playthings in its grasp, are plucked up by the roots, or snapped off like pipe-stems; substantial buildings are first crushed like eggshells, then caught up in the vortex and the debris carried sometimes for miles before it is again thrown off by centrifugal force, and falls by gravitation, anywhere, everywhere, as soon as released from the monster's grasp.

It is difficult accurately to describe the tornado's appearance and work, even for those who have been eye-witnesses of it, or who have personally passed through the horrors its coming brings. While accounts differ as to its appearance and behavior as witnessed from different points of observation and under different circumstances, all substantially agree that it is cone-shaped, its motion rotary, that its apex resembles fire and smoke, and that vivid lightning and heavy rain-falls usually accompany it. In rare instances, electricity in the form of St. Elmo's fire will precede the vortex, and a white, steamy cloud will follow. It will be observed that the form of the tornado cloud is nicely illustrated by the "proof-plane" used in teaching natural philosophy. The small end of the plane is most heavily charged with electricity, and the nearer it approaches to a perfect point, the greater will be the accumulation; a high tension is caused, and the electricity must escape by some conductor. So in the tornado cloud, the smaller the point, the greater the force exerted when it meets the earth.

Artificial Ball Lightning.

In a recent paper by M. Plante, says *Nature*, he gives the result of some experiments made to arrive at the cause and explanation of ball lightning. He was led to these experiments by having one of his mica condensers destroyed by a similar phenomenon. He charged one of his condensers from his secondary battery of 800 pairs, when the condenser was pierced, and instead of a bright spark a small incandescent globule was formed, which moved slowly over the surface of the condenser, following the parts where the insulating layer had least resistance, and destroying the metal film, the path being most curious and erratic. This motion continued, and the globule lasted one or two minutes, until the batteries ran down. In the case of a condenser in which the insulating material was ebonite, a sound was emitted similar to a toothed wheel being rapidly rotated against a piece of cardboard or sheet metal; at the same time there was a strong smell similar to that produced when ebonite is burnt. M. Plante repeated this experiment with 1,600 secondary cells, which gave an electro-motive force of 46,000 volts, and obtained a similar, but much more complicated, result. The second experiment made was to make a condenser of two flat pads of filter paper moistened with distilled water and brought near together, so as to form an air condenser; now, on connecting this condenser with his battery he obtained an incandescent globule which moved about between the pads and passed from one to the other. In this case he noticed that if the pads became dry at any point the globule disappeared, but either appeared at some other point or at the same point again as soon as it again became damp. In this experiment he found that the globule lasted a much greater time than in the case of the mica condenser, which fact was owing to the greater resistance in the condenser plates, which did not allow the battery to discharge so rapidly.

An Early Carboniferous Jungle.

If we could suddenly transplant ourselves from the garden and groves of the 19th century in the midst of a carboniferous jungle on the delta of some forgotten Amazon or some primeval Nile, we should find ourselves surrounded by strange and somewhat monotonous scenery, very different from that of the varied and beautiful world in which we ourselves now live. The huge foliage of gigantic tree-ferns and titanic club-mosses, would wave over our heads, while a green carpet of pretty trailing creepers would spread luxuriantly over the damp soil beneath our feet. Great swampy flats would stretch around us on every side; and instead of the rocky and undulating hill of our familiar Europe, we would probably see the interior country composed of low ridges, unlifted as yet by the slow upheaval of ages into the Alps or Pyrenees of the modern continent. But the most striking peculiarity of the scene would doubtless be the wearisome uniformity of its prevailing colors. Earth beneath and primitive trees overhead would all alike present a single field of unbroken and unvarying green. No scarlet flower, golden fruit, or gay butterfly, would give a gleam of brighter and warmer coloring to the continuous verdure of that more than tropical forest. Green, and green, and green again; wherever the eye fell it would rest alike upon one monotonous and unrelieved mass of harsh and angular verdure.—*Gentleman's Magazine.*

Liquefaction and Color of Ozone.

The most important discoveries during the past three years concerning the properties of ozone are those made by Hautefeuille and Chappuis. They found that ozone is a blue gas, the color appearing sky-blue even when only so much ozone is present as is obtained in the ozonation of the oxygen contained in a tube a meter in length by the silent discharge. Furthermore, they found that under very great pressures the condensed gas becomes indigo blue. If the pressure is increased to 75 atmospheres, and then suddenly relieved, a dense white cloud is formed, showing the beginning of liquefaction, while the same phenomenon does not take place with pure oxygen until a pressure of 300 atmospheres is attained. The ozone must be compressed slowly and with constant cooling, otherwise it will explode with evolution of heat and light. By mixing the ozone with carbon dioxide, and then submitting the mixture to great cold and pressure, Hautefeuille and Chappuis succeeded in obtaining a deep blue liquid, the blue color being due to the liquefied ozone.

The same observers have studied the absorption spectrum of ozone, and accurate measurements of the same have been made by W. N. Hartley. The latter has extended the research to the absorption of certain parts of the sun's rays by atmospheric ozone. By this new optical method he has arrived at the conclusion —1st. That ozone is a constant constituent of the upper atmosphere. 2d. That it is present in larger amounts in the upper than in the lower part of the earth's atmosphere. 3d. That it is the cause of the blue color of the sky.—*Prof. A. R. Leeds.*

THE FLORIDA "SINKS."—A Florida correspondent of the *Boston Star*, in speaking of these curious depressions of the soil in Florida, known as sinks, says: They have attracted the attention of scientific men, and form one of the features of the country to visitors. Timid people are afraid of them, but I do not see any difference between them and the natural depressions one meets with in all wooded countries. Sometimes an acre will commence to sink toward the center, and year after year the depth increases until it reaches its lowest point and stands still. Some of these places are wonderfully beautiful, being covered with a luxuriant undergrowth of bush vegetation, shaded by immense trees, garlanded with grapevines and jasmine, and charmingly draped with the beautiful moss of this country, with perhaps at the base a pool of clear water. These bosky shades are much frequented by cattle, and they enhance by the attractions of life and motion, a picture that any artist might be proud to add to his collection. Sometimes the center really does fall out of sight, leaving a whole, whose depth may be imagined, but out of such fissures I have seen oak trees growing of large girth, proving that they do not go through to China.

A POLICE FORCE OF ANTS.—A queer way of employing ants is reported by an English gentleman who has been traveling through one of the provinces of China. It appears that in many parts of the Province of Canton, the orange trees are infested by worms, and to rid themselves of these pests, the natives bring ants into the orangeries, from the neighboring hills. The ants are trapped by holding the mouth of a lard bladder to their nests. They are then placed among the branches of the orange trees, where they form colonies, and bamboo rods are laid from tree to tree, to enable the ants to move throughout the orangery.

BLEACHING BONES.—By experiments made at the Bavarian Museum a very simple and effective method of bleaching bones, to give them the appearance of ivory, has been discovered. After digesting the bones with ether or benzine, to recover the fat, they are thoroughly dried and immersed in a solution of phosphoric acid in water, containing one per cent of phosphoric anhydride. After a few hours they are removed from the solution, washed in water and dried, when they will appear as indicated above.

NATURAL GAS.—A very well-informed manufacturer, who has some claims to scientific attainments, states that it is his belief that natural gas can be found wherever the carboniferous or coal combinations exist, and that this fact will eventually lead to the departure of iron, glass and other manufacturing establishments from the vicinity of the present coal fields to others, provided natural gas can there be found.

EARTH VIBRATIONS.—According to a French authority, the vibrations caused by a moving railway train a mile distant, may make the use of delicate astronomical instruments impossible for the time being.

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Passing Events.

With this number of the PRESS we close the current volume and the year, and take the occasion to wish our readers the compliments of the season.

There has been a constant and copious rain falling all over the State for a week past, much to the joy of all Californians. The abundant rain has given our citizens all a confidence that the coming year will be a prosperous one, as plentiful crops are assured. It is a matter of regret, however, that the gold in our gravel mines cannot be garnered, and that the abundant waters of the mountain streams pass on without being utilized in washing out the golden earth.

The Christmas holidays have attracted the attention of people everywhere, and for a week past the best of good feeling has been shown as fit accompaniment to the joyous season.

So much snow has fallen in many of the mountain camps that work was practically stopped in many places where arrangements are not perfected for mining in winter. In the higher ranges of mountains many mines have been closed down for the winter.

. One of the inexhaustible productions of California, and especially of San Bernardino county, is borax. Mr. H. M. Storkman has discovered a new deposit on the Mojave river, distant about forty miles from San Bernardino, and within three miles of the surveyed line of the California Southern. It is a very large ledge and assays 54 per cent pure borate of lime.

Close of the Volume.

This number closes Volume XLIX of the MINING AND SCIENTIFIC PRESS.

The length of time which this journal has been published is an indication of the estimation in which it is held by its patrons. When it was instituted the mining field of the country was comparatively limited in area, and the mines of California and Nevada claimed most of the attention. Since then the great mineral regions of Utah, Idaho, Montana, Colorado, Arizona, Dakota and New Mexico have been developed, and there are a hundred men engaged in mining where there was only one then. Hundreds of camps have been discovered and worked out, and hundreds of others have been found and continue to flourish. Railroads have been built all over the coast, and regions then inaccessible are settled up and developed, pouring forth their wealth to enrich the world.

During all these years and vicissitude, the MINING AND SCIENTIFIC PRESS has been devoted to the development of the mining industries of the Pacific Coast. It has recorded all the excitements, discoveries, strikes, failures and general history of the mining camps. It has described the mines, great and small, and in the weekly summary of mining news given the progress of work in all the districts. All the new metallurgical processes, improvements and appliances have been recorded and described, and everything that would be of any practical value to the miner or millman has been given proper attention. Maps of new districts or regions, engravings of new machines or appliances and illustrations of general interest have been given from week to week. Correspondents have sent us descriptions of localities and mines from all quarters; changes in mining laws have been carefully recorded, and, in fact, whatever would be of real value to miner, prospector, metallurgist or mechanic has been carefully watched and presented to our readers.

The PRESS has kept pace with the march of improvement in the region with the industries it represents. Its list of subscribers has increased gradually, and its patronage has long since reached satisfactory proportions. It has been the aim of the publishers to devote its columns to the advancement of legitimate mining; and they have the satisfaction of knowing that the paper has never fathered or fostered any schemes of doubtful character. Its reputation in this respect was established many years ago. It has lived to see the rise and downfall of many rivals which did not pursue a corresponding course.

Of the subjects treated the past half year, the copious index given on the last page is a sufficient illustration. We have endeavored to collect from all sources most reliable information relating to the mining industries as would be of value or interest to our patrons. We have kept track of current events, described the new appliances, processes and industries, and improved the paper as much as possible.

During the progress of this volume we have given a large amount of original and valuable correspondence from different parts of the country. From Idaho and Montana particularly, points just now attracting great attention, our correspondence has been full and reliable. Competent writers were sent there by the PRESS specially to gain the information given in these columns. In many of the camps throughout the coast there are correspondents of the PRESS, who occasionally send us items of great interest and value.

We shall, of course, be glad to have our friends who know and appreciate the merits of the PRESS call the attention of others to the paper. This is a good time to do this, as new subscribers generally prefer to commence when a new volume begins.

There never was a time when the useful news of our paper was more apparent, and our prospects for extending its circulation and increasing the interest with each successive issue, than the present. We shall make the year 1885 one of marked progress with the MINING AND SCIENTIFIC PRESS.

Coke.

Large quantities of coke are used in the smelting works on this coast, but none is made here, there not being any quantity of coking coal on the coast. Our importations vary from 20,000 to 25,000 tons per year, most of which goes to Utah, Arizona and Nevada. The best coke, known as Patent Cardiff coke, costs about $12 laid down here by ship from Cardiff, Wales. This is mainly used by the smelting furnaces in the interior. Some of them have to pay from $40 to $50 a ton for it—and sometimes more—by the time the railroad freight, teaming, etc., is paid, when the coke goes very far.

The lower grades of coke imported are used by local foundries. This costs from $8 to $9 and $10 per ton. All this coke comes from abroad.

A Mining Review.

About the third week in January we shall issue a large double-sheet edition of the MINING AND SCIENTIFIC PRESS, containing a review of the mining industry of the coast for the year 1884.

This edition will contain the statistics of production of the precious metals, lead, copper, coal, iron, etc, It will give the yield of the principal mines in different Pacific Coast States and Territories, the product of mills and smelting works, and statistics of that character. A resume will be made of all events of interest connected with mining for the year, and some account of the condition and prospects of the different camps. The review will include in its scope, California, Nevada, Utah, Arizona, New Mexico, Oregon, Washington Territory, Colorado and Alaska.

We have been in the habit each year of presenting an extended article of the character as soon after Jan. 1st as it was practicable to obtain the desired statistics. There are now so many productive districts scattered over such a large area that it takes some time to gather the facts. The review will be useful for reference in the future, as well as of immediate interest. While we shall be able to gather more or less information from the larger camps, we shall be obliged to any of our readers for any facts connected with their mines or camps, and more especially those from which facts of this character are hard to get. The smaller camps, many of them of great merit, we shall be specially glad to hear from. We ask all our friends to send us as soon as possible any facts relating to their camps and their prospects, yield, etc.

Copper Pyrites.

At Cobar, in New South Wales, blast furnaces and converters have lately been started up by Mr. C. F. J. Wautin, for the purpose of treating copper pyrites on a new system. The object in view is to obtain a rapid and economical method of treating copper pyrites without the aid of other copper ores, and to assist the smelting of them (as is now the case in the greater parts of the metallurgical establishments) without having to submit the pyrites to previous calcination; to obtain a rich regulus, or even rough copper, therefrom, without the aid of extraneous fuel, or to reduce the use of such to a minimum, by taking advantage of the great amount of heat that can be generated by the rapid oxidation of the iron and sulphur contained in the pyrites. The process can be extended to silicious ores, as it is necessary in all cases to add an amount of silica to act as flux for the iron present in the pyrites. The plant at present consists of a low blast-furnace, and what may be termed a modified form of Bessemer converter, with blowing machine, for producing blast. The modus operandi of the process is as follows: A given quantity of pyrites or other mixtures of ores that will yield regulus, say 20 to 40 per cent of copper, is smelted in the ordinary way in the blast-furnace, and the regulus from the same is run as hot and as rapidly as possible through a shoot into the converter; the blast for some time having been turned on before the regulus is admitted. The result of the air being blown through the molten sulphite of copper and iron is, that the sulphur is partly burned into sulphurous acid gas, and partly volatilized, and the iron is burnt into the protoxide, and in that form combines with the silica added for the purpose, or contained in the ore, to form a slag, and in such condition can be removed. It is claimed that the reaction produced either a concentrated regulus of copper, of high percentage, or even rough copper. Thus it will be observed that the sulphur and iron can be removed by one process, notwithstanding the fact that, under present methods of treating copper pyrites, these two elements in their removal form the greatest difficulty to deal with.

Mining Companies' Report.

In the report of Superintendent of the Gould & Curry mine for the year there is little of interest outside of that which we have heretofore reported in our weekly summary of news. The receipts for the year were $304,272, mainly from four assessments, which aggregated $208,486. They have paid out all this except a cash balance of $35,777. The mine labors and salaries took $63,990, and mine supplies $64,910. Half of the expense of the first shaft in the Best & Belcher was $27,656. The following officers were elected: W. S. Hobart, President; A. B. Hull, Vice President; A. Hayward, Robert Sherwood, S. Heydenfeldt, George Congdon, R. H. Follis; Alfred K. Durbrow, Secretary; H. H. Penoyer, Superintendent.

The Mount Diablo mine, Candelaria, has been working the whole year mainly in most exclusively prospecting, and they have taken out only such ore as was necessary in running drifts and winzes. During the year they have driven in all a little more than two miles of drifts and winzes. The most important work of the year has been the sinking of the incline from the vertical shaft. They were enabled to sink this incline more rapidly by surveys, so they could work from six different places at once, and these various workings connected without appreciable error.

The incline is six feet seven inches wide by five feet high, and is timbered with sets of six inches by eight inches, placed six feet apart. There is a man-way two feet wide and a hoisting compartment, 4 feet 4 inches wide, provided with a track of 16-pound T rails, the skip, or "giraffe," in which the hoisting is done, weighs 1,174 pounds and holds 1¼ tons and is self-dumping into a shoot 30 feet above the third level. Three levels have been opened from the incline, the fourth, fifth and sixth. There was considerable work done on the fourth level, and a little work done on the fifth level through winzes sunk from the third level; both of these levels have been connected with the incline and provided with shoots holding about 50 tons each; the material dumped into these shoots from cars is thence hoisted by the giraffe to the shoot above the third level; this holds 100 tons, whence it is carried along the third level and hoisted through the vertical shaft to the surface. The cost of the incline complete to the sixth level, including giraffe and 1,200 feet, 1 inch of steel wire rope, is $24,290 (the cost to the fifth level; the previous lowest workings was $19,720).

At the annual election, the following gentlemen were chosen Directors for the ensuing year: W. E. Norwood, (President), J. M. Shotwell (Vice President), G. W. Grayson, J. N. Knowles, R. W. Heath. R. W. Heath was chosen Secretary, the Bank of California Treasurer, and W. H. Shockley Superintendent.

From the Ophir mine, on the Comstock, there have been in the past year extracted from the mine 5,524 795-2000 tons of ore, of which 4,700 795-2000 tons of ore have been milled, which yielded $66,390.17, being at the rate of $14.12 per ton, or 75 per cent of the assay value of the ore, no allowance being made for moisture. There remains on hand in bins 449 tons, and at the Morgan mill 375 tons. This ore has all been taken out from above the 250 level, and through the Central tunnel, which was cleaned out and re-timbered for that purpose during the previous year.

The influx of surface water having prevented working below the 250 level, in July last a drift was started in a direction westerly from main shaft—at a depth of 500 feet—to cut the bottom of the old Mexican shaft. When connection is made and the water drawn off, they will be in a condition, through the drift, to work over all the old workings and explore any new ground that may have been left above the 500 level.

The work on the 1600, 1700, 1900, 2000, 2300, 2500, 2700, 2900 and 3100 levels has been confined to keeping open the various drifts and winzes used for drainage, and to the necessary repairs to the machinery connected therewith. The receipts for the year were $274,567, of which $220,998 are represented by "drafts on San Francisco office." They paid out $114,897 for wages and salaries; $70,827 for wood; assaying, $6,947; timber and lumber, $9,682; powder, fuse, caps, etc., $6,635; labor in Morgan mill, $17,572, etc.

It is pleasant to turn from these unprofitable

Nevada mines to a dividend-paying California one—the Idaho mine of Nevada county. Comparing the report of this year with that of 1883, it shows that the past year has been much more prosperous for the company than the preceding. In 1883 the total product of the mine was given as $364,599.85; which gave dividends only to the amount of $34,100, while for 1884 the product has been $561,865.49, and the dividends $271,250. The average value of the ore for the past year has also been higher, being $18.04 per ton, as against $12.76 per ton in 1883; and the cost of milling and mining has been $7.86 per ton, whilst in 1883 it was $8.70 9-10 per ton. The secretary's and treasurer's reports show the following figures: Cash on hand at the annual meeting in 1883, $18,-964.26; received cash from all sources during the year, $557,563.13, making a total of $576,-527.39. The amounts paid out for the year are as follows: On superintendent's checks on account of labor, material, etc., $274,695.85; paid dividends for the year, $271,250; a total of $545,945.85. This leaves cash on hand, $30,581.54. There have been 31,144 tons of quartz crushed this year, an excess of nearly 3,000 tons over the preceding year. During the year the 1,400 level has produced the principal part of the quartz extracted. The 1,500 level has been opened, but the regular pay chute not yet reached. The incline has been sunk 119 feet below the No. 15, and during the coming year No. 16 level will be opened. The introduction of water power for the general operations has effected a large saving over the use of steam, estimated at $30,000 for the year. The mine is looking well, and as no further extraordinary expenses are anticipated, such as were encountered in 1881-82, regular dividends for the coming year may be anticipated. The Idaho has been a grand mine in the past, and its treasures are far from being exhausted.

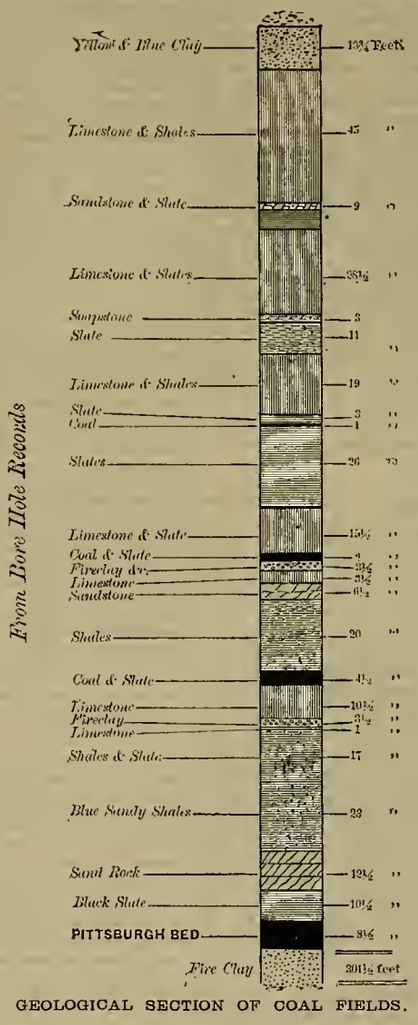
The trustees elected to serve for the ensuing year are Edward Coleman, John C. Coleman, Eugene C. Creller, George W. Hill and Myles P. O'Connor. The officers elected by the trustees are Edward Coleman, president and superintendent; E. C. Creller, vice-president; John C. Coleman, treasurer; George W. Hill, secretary.

Geology of the Connellsville Coal Region.

In the last number of the PRESS were given engravings showing the general method of drawing coal pillars in the Connellsville coal region of Pennsylvania. This coal field has peculiar geological features. It is a shallow synclinal, with slopes of 7° to 3°, moderating downward toward the middle of the basin. Sufficient levelling has not been done to ascertain the position of the axis-line of this large basin. The indications are, from what is known, that its structure will harmonize with the general law of the Appalachian region, *i. e.*, will show a rise along its axis-line northeastward. But this law is never uniform over long distances, as the bottoms of all basins are interrupted by "swamps" and "summits," resulting mainly from the variableness of dips along their course, or rather from the forces that formed these dips.

The coal-bed is underlaid with fire-clay, and has a roof of carbonaceous slates and shales. This roof, for a hight of 8 to 16 feet above the coal, is sliced into blocks by cleavage-planes, rendering it quite brittle and easy to let drop in short sections. This condition of the roof governs the width of adits, headings and rooms. A portion of the upper bench of the coal-bed, from 6 to 12 inches, is usually left attached to the roof, for the purpose of stiffening it, and also to prevent it ravelling down in the mine-ways and room-workings. The coal is quite soft and easily hewn down, as the bed is slashed with planes into thin plates nearly at right angles to the bedding-plane. No "bearing in" or undercutting is required—merely a cutting down or excavating process. The coal is bright, and mines into small pieces or "fine coal."

Beneath this Connellsville or Pittsburgh coal-bed, occurs an interval of from 400 to 600 feet of "barren measures," separating it from the lower productive coal-measures of Western Pennsylvania. There is great similarity in composition in the coals of these upper and lower coal-measures in the same geographical belt or basin. This should afford the Connellsville coke producers a large additional supply of coal from the beds in the lower coal-measures. The engraving herewith is a geological section, as shown by a bore-hole. The drawing is on a scale of 50 feet to one inch, and the geological features are plainly indicated.


From Bore Hole Records
Yellow & Blue Clay — 19¾ Feet
Limestone & Shales — 45 "
Sandstone & Slate — 9 "
Limestone & Shales — 38½ "
Soapstone — 3
Slate — 11
Limestone & Shales — 19 "
Slate — 3 "
Coal — 1 "
Shales — 26 "
Limestone & Slate — 15½ "
Coal & Slate — 3 "
Fireclay &c. — 3¼ "
Limestone — 3½ "
Sandstone — 6½ "
Shales — 20 "
Coal & Slate — 4½ "
Limestone — 10½ "
Fireclay — 3½ "
Limestone — 1 "
Shales & Slate — 17 "
Blue Sandy Shales — 33 "
Sand Rock — 12½ "
Black Slate — 10½ "
PITTSBURGH BED — 8½ "
Fire Clay — 30½ feet
GEOLOGICAL SECTION OF COAL FIELDS.

Huntington, Hopkins & Co.'s Display at the State Fair.

The hardware and iron firm of Huntington, Hopkins & Co. have for many years been exhibitors at the California State Fair, but it was not until three years ago that the house began to pay special attention to the display of their wares at these annual exhibitions. Since then their efforts have met with universal praise, and been considered the most attractive in the pavilion. At the fair of 1884, the occasion of the opening of the State Agricultural Society's magnificent new pavilion, the firm determined to out-do all former efforts in the line, and succeeded beyond their expectations. The large engraving on the first page of this week's PRESS will give an idea of the arrangement of the exhibit.

The tastefulness of arrangement and scale of the exhibit struck every one who went in as a most prominent feature in the pavilion, and visitors who saw it always remember it as a leading attraction. It was one of the features that helped make the visitors realize the magnitude of the success of the fair in the new building. While there were very many meritorious exhibits, no other one attracted such universal attention as theirs, and for it the society awarded a special gold medal as the most attractive display.

As the engraving shows, the exhibit was arranged in pagoda shape, the whole being unique and original, as well as being effective in showing the wide scope of the business of the firm. The exhibit was designed and carried out by Mr. Geo. R. Hansbrow. All the exterior designs were worked out by the disposal, by infinite care and taste, of a myriad of pieces of hardware tools and house trimmings on a background of dark red, relieved by blue and black trimmings. The central pyramidal structure was 18 feet square at the base, and 40 feet over all in hight. Like sentinels, at corners rose four graceful towers, in keeping with the general design and finish. The upper section of the central structure was of less depth and breadth, and it was crowned by a circle of ever-revolving locomotive head-lights, surrounded by a broad circle of polished and glittering hand-lanterns. Over all rose a broad, slowly-turning star, decorated with circular saws and varieties of small hardware, all flashing back the light as the beautiful design revolved. The cornice below was marked out handsomely with sheep shears.

Each panel of the upper section bore great circular saws, that revolved slowly, and the bands of reflected light thereon resembled quick-moving dial hands. The surrounding decorations were fanciful designs, worked out with such odd things as spoons, butcher knives, brass door-rail, picture nails, etc. Below these flared the four sloping faces of the roof of the main body, one bearing the name of the firm and of San Francisco and Sacramento, in letters of brilliant red, hemmed in with thick-set brass nails. Along the eaves graceful festoons of chains were caught up with various glittering tools. Two handsome signs of the firm, in gold letters, graced the roof, which was supported by four pillars from the floor of the base, each decorated with thermometers, bronze butts, magnets, etc. On these, here and there, revolved smaller circular saws. The panels of the body of the pagoda were thick set, with a great variety of unique and graceful designs, all of varied metal goods, house trimmings, all manner of polished hardware, and tools representing all the trades. Here, too, the eye rested on handsome designs formed of brass, plumbing goods, steam and water gauges, and the like.

In one of the squares noted was a landscape scene, representing a "lad and lassie" coming through the field, every portion being composed of escutcheon pins, small chains, horse-shoe nails, etc. A number of esthetic designs framed this picture.

The lower squares—those on the base of the grand pagoda—were decorated with heavier articles from the stock of the firm. Hay-forks, shovels, spades, garden tools and such implements, ornamented the center, whilst a border was formed of horse-shoes, washers, bolts, screws, etc., whilst there were pyramids of shot, anti-friction metal, shoe and stove blacking, cordage, belting, hose, etc., resting beneath. All the newspapers in the State which paid any attention to the State Fair, awarded the palm for completeness, originality and beauty to this display.

In the establishment of which there was so worthy an exhibit, mining supplies are largely represented. There are picks both for surface and drift mining, blasting powder of different kinds, cordage, tackle blocks, rubber and leather belting of all sizes, drills of every variety, pumps, both common, lift and force. Lanterns and headlights, of all makes and grades, form an important part of the business. Barbed wire can also be obtained, in any quantity for fencing purposes. Pocket and table cutlery, both of English and American make, door handles and locks, and builders' turnings, are to be found in the store, from the most expensive articles, fit for the residence of the millionaire, down to the bolt for the barn door. They have a fine selection of Parker, Colt's, Baker's and English breech-loading guns, Winchester, Marlin's and Colt's rifles, and pistols of all makes. The necessary ammunition is on hand, as well as a fine supply of fishing tackle, artificial flies and other baits, rods, reels, lines, hooks, and every want of the disciple of honest Isaac Walton. Thus are the settler, mechanic and sportsman all supplied from this one store with everything which is, and much which is not, classed as hardware.

Humid Metallurgy of Copper.

The best methods of extracting copper from its ores are adopted under the following circumstances:

I. When the quantity of copper present is too small to admit of the application of a furnace method. The reagents consumed in dissolving copper from its associated minerals are generally in proportion to the absolute quantity of copper present; and, consequently, when the copper contents are low, the quantity and cost of the necessary solvents are proportionately reduced, in case the non-cupriferous ingredients are inert and unacted on; whereas the fuel, which is the principal reagent in all smelting methods, has to dispose of and alter the constituents of not only the copper but likewise the gangue.

II. When the ore contains injurious elements which cannot be eliminated in the smelting furnace, as, for instance, arsenic and antimony.

III. When the copper is associated with other metals, economically valuable, which, if all were smelted together, would pass into valueless combinations. For instance, the pyritous ores of Spain, after their sulphur has been roasted off, might be smelted, but by so doing the silver would enter the copper and be lost, and the iron would enter the slag and become valueless. These conclusions are those of Mr. James Douglas, Jr., a well-known authority on this branch of metallurgy.

Local conditions at any given locality, such as the value of fuel, which is always sparingly consumed in humid methods, compared with the value of the dissolving or precipitating reagents, which in some places are very cheap and in others unobtainable at economical figures, as well as the character of the ore and its contents, must determine whether a dry or a wet method shall be selected, and if the latter, which one of the many proposed shall be chosen.

Among the deterring conditions in any case is the presence of a considerable quantity of lime, magnesia, or other constituent in the ore, which by consuming the solvent occasions its waste.

Every wet method consists of two principal operations: (1) The separation of the copper by solution from the other ingredients of the ore or mixture; (2) the separation of the copper in the solution from any other substance held in solution, by precipitating it as metal, as oxide, or otherwise.

All wet methods may be grouped into two principal classes:

I. Those in which the fresh solvent has to be used for the extraction of the copper from each successive charge.

II. Those in which the solvent is renewed or regenerated in one of the latter stages of the operation.

More Water Power for the Grass Valley District.

The introduction of water hy the Idaho Mining Company to furnish power for hoisting and milling purposes, was a new departure that the *Grass Valley Union* stated at the time was destined to bring about a revolution in quartz mining operations in this district, as the economy effected hy the use of such a motor would he the means of encouraging other efforts of a like character. For some time past the Empire Mining Company, the oldest mining organization in the district engaged in active work, has had under consideration the bringing of water power to that property, and after a full examination of the subject, the making of surveys, estimates of cost, etc., the result has been the organization of a company of San Francisco men who will engage in the carrying out of the enterprise, which will have for its scope the furnishing of water-power for the mines at Union Hill, Ophir Hill, along the hauks of Wolf creek, and to the west side of that stream if the companies now operating choose to avail themselves of this cheap and efficient power. Supplying the Empire Company is the first object in view, hut the pipes will be of such dimensions as to carry sufficient water for all the points just mentioned. The water supply will be obtained from the South Yuha Canal Company, and will be taken out at a point near the large reservoir at the foot of Banner Hill. From thence it will he conveyed in pipes 25½ inches in diameter by way of Union Hill to Ophir Hill, the distance to the latter point being over 2½ miles and the fall 400 feet. The pipes will have a carrying capacity of 800 cubic inches. At Ophir Hill connection can he made with the Magenta mine, and on Wolf creek with the whole series of mines in that part of the district, some of which would obtain the water under a pressure of over 500 feet. The organizers of this enterprise have satisfied themselves that they will find a market for this water power, as it will he so much cheaper than steam that no operating company will fail to avail itself of this motor at the earliest opportunity, and the owners of a number of idle properties would be encouraged to undertake operations that the cost of steam plants has heretofore forbidden. It is expected also that the power will be the means of starting custom milling on a large scale, as the cost of reduction can he brought down to at least one-half of present rates, which will he a very important item to prospectors as well as companies conducting work on a large scale. That it will work a very great and important change for the better in the carrying on of mining in the district is a self-evident propcsition, and that a largely increased output of gold will follow as a matter of course. The enterprise has gone so far that contracts have been made for the water supply and the laying of a pipe line to the Empire mine on Ophir Hill, and the water will be brought to that point carly in the coming spring.

The New River Mines.

The *Trinity Journal*, in speaking of the letter of "J. H. C." in the MINING AND SCIENTIFIC PRESS of Decemher 6th, says: The expense by the Weaverville ronte is not over-stated, and the distances are about correct. The distance from Arcata, however, is very much more than shown, unless we have been grossly misinformed by parties who have freqnently traveled it and should he fully conversant with the facts. They claim the distance to he 140 miles—not 80—and that four days' riding is required to make the trip. Passengers certainly cannot be transported this distance through the mountains, on saddles, for $10 or any less than twice that sum. At the present time packers are charging *eight cents* per pound for packing provisions from Arcata to the New River mines. This, according to the figures given, would he one cent per pound for every ten miles; and if correct it is only a wonder that all Humboldt county don't go into the packing husiuess. The article in the PRESS seems to he a Humholdt view of the situation, and written with the one object of turning travel that way. We are told that the Weaver route is "simply impassable in the winter, as there is a high range of snow-clad mountains to cross." Nothing is said as to the route *via* Eureka and Arcata, hut the reader is left to suppose that no such impediments will he found in that direction. The fact is, the mines are 4,100 feet above sea-level, and can only be reached by crossing mountain ranges, which are as high and as snow-clad on one side as on the other; and at the season when they are impassable there will be no occasion to travel, as prospecting would bc ont of the question in the winter. From this way there is now a good wagon road to the town of North Fork, witbin forty miles of the mines, and a splendid trail from there to Rattlesnake—twenty-five milcs further—to within fourteen or fifteen miles of the new district. A trail ou wagon-road grade, to connect, will he built just as early as practicable in the spring, and should the mines prove anything like as rich and extensive as they now promise, a wagon road will be built all the way before the close of summer. The route *via* Weaverville is the shortest and only practicahle one, and prospectors taking any other will find themselves sadly mistaken as to distance and expense.

Sunny Hill Mines.

It is always a pleasant task on our part to give puhlicity to any and all laudahle enterprises going on in any portion of our country, and we are pleased this week to he ahle to inform our uumerous readers of a new enterprise now on foot, in Sunny Hill mining district, that is destined to hring tbat rich mining field into a prominency second to none in the country. We are creditably informed that Messrs. Sharp, Day & Smith have purchased and are now constructing in said district a first-class quartz mill of 60 tons capacity per 24 hours. The mill and fixtures are of the latest and most approved methods of working quartz and saving precious metals, and will he built on Cottonwood creek, in a convenient place to all the mines of that section. Twelve men are now at work on the mill, and it is said that the work will he completed within forty days from this date. The gold in most of the hest mines that have yet heen discovered in that camp, is qnite fine, hut generally free from refractory elements, and is, therefore, quite easily saved. The character of the gold, like that found in the placer heds of that region, is very good, worth about $19 per oz. We congratulate the miners of that district upon this their greatest achievement toward their future prosperity. And the work is destined, no douht, to prove of material benefit to the whole of northwestern Shasta, and will greatly stimulate other and kindred enterprises in that and adjoining districts.

We have on several occasions heretofore referred, to the mines of the Sunny Hill and Bullychoop, and are truly gratified to see such unmistakable signs of future prosperity for that great gold-hearing quartz region. A gentleman now engaged in this office, and who was the pioneer prospector of both these mining fields, informs us tbat the gold belt of Sunny Hill is one and the same as that of Bullychoop; heing a continuous system of quartz veins for over fifteen miles in length hy about one-half mile in width, and the gold found in the Cottonwood and adjacent gravel heds, as well as that fonnd along the sonrce of Jerusalem creek, all came from this helt. Several very rich ledges have already been found, and some are now being worked, on the Jerusalem side of the divide. This, indeed, must be a mining field worthy of the attention of hoth prospectors and mining capitalists, for there are good grounds for helieving tbat this is a very extensive and rich mining field.—*Anderson Enterprise* (Shasta Co.).

Rich Discoveries in Lower California.

The San Diego *Sun* contains the following letter from W. G. Shofield, who is at present engaged in mining iu Lower California. The letter was written to Henry Daggett, of San Diego:

Since my last lines to you I have heen exploring the Illu·ian ranges and deposits, and discovered in the differeut ranges to the south and west of Santanna illurial, deposits and cement beds, indicating broken and detacbed masses of an ancient channel, similar to that of the Blue Lead of California, ranging in an east and westerly direction, and at different points where the surface has been worked by Indians and early settlers for placer gold. I followed this range to within 15 miles of the Gulf of California, in the foothills of the San Francisco mountains, some ten miles south of the sink of the El Tar river, and about sixty miles southwest by west of El Tar. At this point the channel hreaks to the surface, showing it to he true and well defined for a distance of from eight to ten miles, and ranging from 3 to 600 yards in widtb. The bedrock of the channel is from 35 to 45 feet helow the surface. There are already twelve working shafts to bedrock, which has already yielded, as nearly as can he estimated, from $30,000 to $35,000 each. There are about 100 Mexicans and Indians at work here, and some 50 shafts being sunk. The best of the channel is already taken np, and more coming every day. It is common to see them dry-wash a pan of dirt from the bedrock, and get from one so as high as five ounces to the pan. There is one dry-washer here at work. Yesterday I saw them clean up 25 ounces from eight tons of dirt. A good dry-washer will clean up from fifteen to twenty tons per day. They are ohliged to dry-wash altogether, as there is no water here. Should there be anything of a rush of people here, there will surely be a water famine. I am paying 25 cents per bucket for water, which is packed in here on jacks, and at the point where it is obtained there is scarcely enough to supply the present demand. My partner, Mr. Milcs, is taking care of our quartz mine near Santanna. I have secured for us three placer mines here; have one shaft sunk to pay dirt, and two more under way; also a dry-washing machine en route from Santanna Station. It is of Los Angeles manufacture. The gold is selling here for $16 per ounce, while it is worth at least $18. I will send you a sample at my earliest convenience.

COMSTOCK QUARTZ.—At the north end mines every preparation is heing made for the change from mining at great depths to the exploration of gronnd nearer to the surface, and which was hastily passed by years ago in the rush for the lowest attainable point. It was then the idea that at some point helow the 3000 level a fertile zone would be reached, there heing indications that the east wall of the vein was straightening up and that the ore channel would thus he compressed. However, it has been found that while narrowing on the east, the vein has spread out to the west and still remains of a width of a thousand feet or more. Tbe quartz of all tbis great width is fertile, assaying from a few dollars up to $50 or $60 in a few spots, but no part can be found in which the ore is sufficiently concentrated. Were the vein compressed to a width of 100 feet at any point the whole would pay for extraction, hut the metal that is scattered through 1,000 feet of ground is lost, as there is no way of working by which it can be made to pay.—*Virginia Enterprise.*

FOUNDRY EXPERIENCE AT ST. LOUIS.—The experiments which the Standard Foundry Company bave been carrying on with their small cupola have resulted very satisfactorily, and in so resulting have upset the views of a nnmher of old foundrymen. These thougbt that a cupola having an iuside diameter of only 20 incbes would not work, for the very simple reason that it would choke up. On Friday, the 29th ult., one of several fairly representative trials were had with this cupola, and from notes then taken the following results are given: The blast was turned on at 10:5 A. M.; the tap-hole was closed at 10:20; the first iron (700 pounds) was taken at 10:35; the hottom was dropped at 12:15 P. M. In all 4,500 pounds of iron were taken out during the heat, and onc pound of fuel was burned to seven pounds of iron melted. In the afternoon the company charged up and relighted at 2:30, and tbe rest of the day took out about 500 pounds of iron every 12 minutes. In fine, the results were substantially the same in the afternoon as were obtained during the morning heat. The object of the company's experiments is to demoustrate the practicability and tho profitableness of running a small cupola from 10 o'clock in the moruing all day. There are a great many break-down jobs which such a course would probably hring in their way.—*Age of Steel.*

WILL GIVE UP MINING.—I. L. Requa, who has been on the Comstock actively engaged in mining for over twenty-five years, will withdraw from tbe lode about January 1st. He will remain until he gets the new hydraulic pump at the Combination shaft in full and successful operation, however, then will go to his place in California, and take things easy for the remainder of his days. When a man has given twenty-five years of his life to mining, he deserves to take a rest. Besidcs, a man takes chances every time he goes into the lower levels. "The pitcher that goes often to the well is broken at last." Though a man may have escaped accidents for twenty-five years, he may still go nnderground once too often. Who will take charge of the Chollar and Potosi mines as Superintendent remains to he seen. Mr. Requa says that he would not remain though assured the positiou. Having put in a quarter of a century at mining, he feels that he has done his part, and is willing to see some one else take np the work and go on with it. However, "once a miner, always a miner;" and after a year or two in the "cow counties," Mr. Requa may again feel an itching for the mines.—*Virginia Enterprise.*

REDUCTION WORKS.—The first great care of the people of tbis section ought to be, in our opinion, the establishing of general quartz reduction works in Prescott; works to which the miners could bring ores in any quantity, sell them or have them treated. Ask owners of mines why they do not work their properties and they will tell you that they would gladly do so if they could have their ores worked in a proper manuer at home. But few ores are rich enough to pay from $50 to $70 per ton for transportation and treatment, while many mines produce ores that can be handled here at home with a profit. If all who would derive benefit from the working of mines should unite and raise means to start and run, for awhile, works of the right sort, right here in Prescott, we would very soon have a right lively town and country. With necessary additions the plant ou Lynx Creek would answer every purpose, and it, or some other, should be immediately procured.—*Prescott Courier.*

A NEW COPPER EXTRACTING PROCESS.—At the Parrott an experiment is heing made (resulting successfully, too) with a new device for extracting copper from the ore, the patent right for which, in the United States, is owned by Mr. Farrell, one of the heavy stockholders of the Parrott. The new process is to smelt the ore hy the use of superheated air, no fire touching the ore. By this method the ingot copper is produced direct, and so economically that if the new smelter works as well in actual use as it does in experiment, Montana copper can he laid down in New York for several cents less than the present prevailing prices, thus working a complete revolution in the copper industry. Copper men, as a general thing, however, are disposed to lack confidence in the practicahility of tbe new scheme.—*Montana Inter-Mountain.*

THE new German colony of Olivenham, San Diego county, is growing rapidly. The oolonists are very busy clearing land and burning brush, preparatory to plowing same for vineyard and other farm purposes the coming winter.

Notices of Recent Patents.

Among the patents reeently ohtained throngh Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

BRUSH.—Benjamin Normandin, S. F. No. 308,427. Dated Nov. 25, 1884. This clotbes or hat brush consists, as a new article of manufacture, of a brush, the ruhhing or frictional surface of which is made of the back of that genus of tree known as the *Sequoia*. It is adapted to brush hats, clothes, and similar articles, or for use as a flesh hrnsh.

STONE-DRILL.—Thomas M. Yerkes, S. F., No. 308,454, dated Nov. 25, 1884. This invention relates to certain improvements in rock drills, and the mechanism hy which they are operated, and it consists of a means by which the drill may be held in position and returned after each stroke of the hammer, and by which it is partially rotated before the next stroke without tbe aid of second person. The patent covers the details of construction.

GARMENT FASTENER.—Andrew V. Smith, S. F. No. 308,439. Dated Nov. 25, 1884. This device for fastening garments consists of a peculiar bent or coiled spring-wire, the separated ends of which are heut inwardly, and again at right angles, with the body or main portion of the wire, and are provided with transverse loops. This fastener is adapted to he made as ornamental as possible, and will take the place in many cases of buttons and pins.

DEVULCANIZING AND RESTORING VULCANIZED-RUBBER.—John J. Montgomery, Fruitland, San Diego Co. No. 308,189. Dated Nov. 18, 1884. This inventiou is a new and nsefnl improvement in devulcanizing and restoring vulcanized rubber to a condition in whicb it can be reworked, and it consists in cutting up the rubber, immersing it in a suitahle hydrocarbon oil obtained from petroleum, and subjecting it in a tight vessel with the oil, to a temperature above 355° F., nntil it is reduced to a plastic mass, from which tbe oils are extracted hy heat, either alone or assisted hy jets of steam passed through the mass, or carried further to a complete solution, from which the remaining oil may or may not he extracted by the means described. Tbe object is to devulcanize tbe rubber and reduce it to a conditiou (without injnry or destroying its properties) in which it can readily be reworked for any purpose, or may be vulcanized again.

EMBROIDERY FRAME.—Izora Elder, S. F. No. 308,406. Dated Nov. 25, 1884. This novel embroidery frame consists in a combination of parts adapted for various adjustments to form a convenient and effective device for supporting and stretching the material. More particularly it consists of two standards, furnished with adjustable cross-pieces between, and in which is supported and journaled a rod, upon which one end of the material is wound. This rod has loosely fitted upon it arms heavily journaled, on their other ends a rod upon which the other end of the material is wound. By means of certain clamping screws, the quadrilateral or rectangnlar frame formed hy the two rods and the two arms, and in which the matcrial is suitahly secured, is adapted to have a vertical and swinging adjustment, and to have a side or extension for the width of the material, which, by revolving the rods upon which it is wound, any portion of it may be presented in the frame. The object of the invention is to provide a frame which, hy reason of its various adjustments, will be convenient to work at, and to which any length of material may be secured and tightened, or stretched, with ease; also to furnish a simple and ecouomical frame-one which may be readily put together, or taken apart for convenience in transportation, and which is not likely to get out of order.

IT PAYS TO TEAR DOWN A MILL.—The Hawthorne *Bulletin* learns: When it became definitely settled that work was to he resumed at the Belleville mills a force of men was put at work cleaning up. As is well known, the mills are dry crushers, and, as is equally well known, one of the greatest drawhacks of the present dry crushing system is the immense amount of dust flying through the mill. A great deal of this dust had settled all over the mills at Belleville. It was swept up and a test made of it. The result shows between 75 and 80 tons of dust, which assays about $90 per ton. As it is already crushed very fine, the cost of working is reduced, and the clean-up may he considered a little bonanza by itself.

A NEW SAW-TOOTH.—An insertible saw-tooth being brought out hy John H. Brown, South Trenton, N. Y., is constructed with its forward edge curved in its inner part, and inclined forward in its outer portion, its rear edge straight, and its outer edge inclined outward from the straight rear edge to the point, to adapt it to be inserted in a correspondingly shaped seat in a saw-plate.

IMPORTANT EXPERIMENT.—The Russian government has projected an experiment to ascertain whether naphtha residium can bo advantageously used as fuel for the engines of steamers. If the experiment is successful, the adoption of this substance instead of coal as fuel for the Russian fleet is contemplated.

Inherited Tendencies.

It has become a proverb that the sins of the fathers are visited upon the children. It has always been so, and will ever continue to be so, but in a fuller and truer sense than these words are generally understood. In no sense can such a visitation be regarded as an act of retributive justice; it is inherent in the very nature of things. Heredity is as true in its action upon humanity as in its operation upon horses or cattle; and it speaks very little for the boasted superiority of man that he nicely calculates the results which follow the crossings of his domestic animals, and takes so little notice of those that result from his own course of life. Those who wonder how it is that clever men have stupid sons forget that the children had a mother, and those who are astonished that dull men sometimes have smart sons forget the female parent. Moreover, it must be remembered that the too great intensification of a virtue or a talent may, in the course of a generation or two, become a vice or an aberration of intellect by destroying the mental balance. For instance, genius is the consummate flower of a fine nervous organization, but the child of two highly nervous persons is likely to have a nervous system so keenly sensitive, that unless the environments be of a soothing nature, he may become mentally unhinged, while a repetition by himself of the same mistake may result in downright derangement of mind. The child of two quiet, phlegmatic parents certainly need not fear nervous excitability, but unless his surroundings give his nature a powerful push, he is likely to become a prey to constitutional indolence, and perhaps stolidity. To avoid this intensification of temperament, it is obviously advisable that those who become partners for their own lives, and in the formation of the bodily and mental tendencies of their children, should themselves be of different temperaments, one of which may in some degree offset the other.

What is true of temperament is equally true of the reasoning powers, so that it may happen that the child of two ordinarily intelligent individuals may have more intelligence than either of them; and judicious selection of a partner may in a few generations result in the production of positive talent in some definite line, or culminate in that rare flower of humanity called genius. If the family does not cease with this gifted individual, it is almost sure to retrograde, for the great genius must mate beneath itself. Nor can it be said that the continual marriage of brain with brain will result in permanent mental advance. If care is not taken to provide for the physical faculties, the mental will fall for want of basis. Some conception of this fact seems to be implanted in the inner nature of human beings, and often works out its results in spite of the conventionalism of society. Who does not know that the man of active brain and nervous sensibility admires a woman of fine figure, while the clever girl doats on a strong, handsome man? This is the secret of some of the elopements that surprise four-storied society. It is not strange that the pale, delicate girl, brought up to thump a piano, mince a little French and do dainty needlework, should turn away in disgust from lisping dudes, and bestow her charms upon the man of bone and brawn.

Though every individual inherits something from both parents, the members of the same family do not inherit in equal proportions or in the same direction, so that one child most resembles the father, while another has most of the mother, or some may have the mental characteristics of the father, and the bodily constitution of the mother, and in others the reverse of this may occur. A child may so closely resemble one of its parents in face and physique that a superficial acquaintance sees no trace of the influence of the other parent, yet those who know the child well may also know that all its mental traits are those of the parent to whom it has the least outward resemblance. Heredity does not always act by producing a near resemblance to the immediate parent. Causes too complex to be well understood, produce, in many cases, a resemblance to a remoter ancestor. Such cases as these are known as reversion, and, though less studied in our own species than they are in the animals we keep for use or pleasure, are by no means rare.

It cannot be too much insisted upon that there are but two factors in the production of all mental and physical characteristics. The first of these is heredity—the influence of two ancestral lines as transmitted to the young by its two parents; the second is the environment that is, influence of every kind that acts upon the young. In the case of human beings the power of environment—of the education of circumstances and surroundings—is far greater than it is in the lower animals. Man begins life as the most helpless of beings, and the influence of his surroundings begins to act long before that of heredity is completed. It thus often comes to pass that mental and even constitutional traits become marked, not eradicated, but hidden beneath the power of influences brought to bear later in life. Thus a man who has inherited a fiery and domineering nature may by the force of his surroundings appear to the world as the gentlest of men; and a man who has a hereditary tendency to consumption may, by care and favorable surroundings, never develop that disease. Change the circumstances of these two men, and the true constitution of the one, and the hereditary temper of the other will declare themselves ere long.

USEFUL INFORMATION.

How to Preserve Cut Flowers.

A lady, who has often kept cut flowers for over a week, says:

"I have found that cut flowers need three things to prolong their life plenty of moisture, a cool temperature, and immunity from draughts. If you set a vase of flowers in a current of air they will lose their freshness in a very little time. They will also wilt quickly if you place them in a hot room. I always keep cut flowers well sprinkled with cold water during the day, and set them in the coolest part of the room, and away from open windows. In the night I put them into the cellar and turn an air-tight vessel over them, after first covering them with a thin cloth well moistened. Often when they have begun to hang their heads during the day this treatment during the night revives them. Flowers keep longest in a temperature of from 40 to 50 degrees above zero."

A BLACKSMITH BIRD.—"I have the only blacksmith bird in this country," said the keeper of a restaurant in Fulton and Middagh streets, Brooklyn, as he pointed at a cream-colored bird, about the size of a dove, hanging in a wooden cage against the wall, and ineffectually trying to hop to some part of it that was free from flies. "I bought Dick from a man who got him in South America last fall. He gave $5 and a pocket pistol for the bird, after the natives had spent a fortnight in the woods to get it. The man sold it to me for $10. The bird is called a blacksmith for the reason that he makes a noise like that of a blacksmith pounding on an anvil, and sometimes like the filing of a saw. He has no feathers under his wings. He will begin to sing in a day or two."—*N. Y. Sun.*

A NEW THING in fire apparatus, says the *American Journal of Industry*, is the electric hose. A wire runs along in the cotton or rubber part of the hose, continuing the connection as each section is attached, and over this passes electricity, generated by one of the engine's fly wheels. Connected with the nozzle is a little contrivance, by which the engineer can be told, although squares distant from the man who is playing water on a fire, to "turn her on," "cut her off," "stop," or "go ahead," or anything else that can be agreed upon, by a signal, which is struck on a gong on the engine.

THE LARGEST BLOCK OF ALUMINIUM.—The aluminium pyramid which is to form the apex of the Washington Monument has a perpendicular elevation of nine and a half inches, and each side of the base measures five and a half inches. Its weight is 100 ounces. If it were made of copper its weight would be 326 ounces. The surface appears much whiter than silver, and is so highly polished that it reflects as a plate-glass mirror. This pyramid of pure aluminium was produced from American ore, and it is the largest block of that metal ever cast or made in any country.

BRASS CASTING IN INDIA.—The casting of bronze statuary is carried on quite extensively at Bangkok. The alloy used consists of copper and lead, sometimes with the admixture of a small quantity of zinc. A clay model is first made; upon this a coat of wax is molded, and over this again is put another layer of clay. The whole is then baked, the wax running off through apertures left for that purpose, and, the central core being kept in its place by iron pegs, the alloy is then run into the space previously occupied by the wax.

IMPROVED HARVESTER FOR SUGAR PLANTATIONS.—After years of experience, a harvester has been perfected which, if its workings be all that is claimed for it, will prove of immense utility to the sugar planter as well as the corn grower. One man and a boy, it is said, with a good team, is sufficient to operate this machine, and will accomplish the labor of several hundred industrious negroes.

ELECTRIC CARRIAGES.—Prof. Edison recently remarked that every poor man will be enabled to keep a carriage when somebody shall solve the problem of making electricity directly from the combustion of coal instead of by the present method, which involves first the production of heat, then steam power, and then the consumption of this power in obtaining the electricity.

NEW POWER.—A recent calculation shows that a man weighing 160 pounds, and running a mile in six minutes, performs work equal to that of a half-horse engine, while a walker sustaining five miles an hour for a long day, does work equal to that of a quarter-horse engine, and consumes only one-twentieth of the weight of food or fuel.

CANVAS BAGS, it is said, can be made as impervious to moisture as leather by steeping it in a decoction of one pound of oak bark with fourteen pounds of boiling water, this quantity being sufficient for eight yards of stuff. The cloth from which the bags are made has to soak 24 hours, when it is taken out, passed through running water, and hung up to dry.

THE NEW MANGANESE STEEL.—The invention of Mr. Robert Hadfield, of Sheffield, England, for which patents have been secured both in this country and England, is attracting considerable attention, both here and abroad. M. Gautier, of the Terre Noir Works in France, has become the representative of Mr. Hadfield in France. The more recent experiments of Mr. Hadfield demonstrate that he was justified in all the claims he made for the steel. The castings are free from the honeycomb, the welding capacity of the steel is greater, it has greater tenacity when hot, and can be used as castings for many purposes for which now forged steel is demanded. We also learn that some very interesting and important experiments have been or are about to be made with this steel in connection with shells, armor-plates and guns.

THE NEW KIND OF CLOTH, already alluded to in these columns, is being quite extensively manufactured at Lyons, France. It is made from the down of hens, ducks and geese. Seven hundred and fifty grains of feathers make one square metre of light and very warm waterproof cloth, which can be dyed in all shades.

THE LONGEST FIBER.—The fiber of silk is the longest continuous fiber known. An ordinary cocoon of a well-fed silk-worm will often reel 1,000 yards, and reliable accounts are given by Count Dandolo of a cocoon yielding 1,295 yards, or a fiber nearly three-quarters of a mile in length.

STEAM ENGINES are now used to a greater extent in the United States than water wheels. In 1870, there were in use, according to the census, 51,068 water wheels, and 40,191 steam engines. The same authority gives 10 years later 50,483 water wheels and 55,404 steam engines.

ABRAHAM LINCOLN'S INVENTION.—The model of an apparatus for "lifting vessels over shoals," for which a patent was issued in 1849 to Abraham Lincoln, will form a portion of the Patent Office exhibited at the New Orleans Exposition.

OF the ninety-eight strikes in the United States during the past year, all but seven were against the reduction of wages.

THE 50,000 tons of soot taken from London chimneys every year is sold for $205,000, and used as a fertilizer.

GOOD HEALTH.

"I've Been Thinking" Series.—No. 2.

[BY JEWELL.]

Health.

This is a serious question, friends. When we bring to mind the fact that we are a nation of invalids—dyspeptics mostly—a disease which underlies nearly all others, it is well worth our while to think, talk, and write upon the subject. Poor health effects us individually and collectively, also. It is estimated that every sick person, if long ill, saps the vitality of at least *seven*, who are moderately well. This, I think, a large estimate, but it is certainly true that at least two lives are devoted or sacrificed for every one! Perhaps this may account for the many who are leading half dead lives.

The chief requisites to insure health are, good food, pure air, sufficient exercise, abundance of sleep, perfect rest, plenty of sunshine, proper clothing, a harmonious social life, and a clear conscience. Of the many causes of disease, perhaps our ignorance of the laws controlling and belonging to life, is greatest. Then, too, a thoughtless disregard for these laws and bad habits, which are sure to undermine the constitution. Inherited weakness, as well as tendencies to disease, curse many an aspiring life. Bad habits of living, by vitiating the blood, retarding the circulation and exhausting vitality, soon destroy the regular action of the various organs. Pain then gives the brain warning that something is wrong—that the machinery is out of order. Fortunate is the heeding individual who can repair damages now by rest and assisting nature a little in some simple way.

The Patent Medicine Nuisance.

Woe be unto those who embark upon the sea of patent medicines at this stage. Like the straw the drowning man caught to preserve life, they are about as safe. The wonder is that any one is sick, while such an array of cure-alls are advertised in papers, having their millions of testimonials, filling the drug stores and riding every fence rail! The utter ignorance of the people is well illustrated by the vast yearly incomes of some of these patent medicine vendors. It is astonishing, also, how long the vitality will endure abuse, and exist. Instead of using only the *interest* of life—recuperative energy—a large majority are actually consuming the principal itself.

Yet we wonder why so many die young, in the prime of life it may be, with perhaps some simple disease that the attending physician is usually most successful in treating.

Observe the ordinary young person's life of these days. Is it exemplary? It may be; and yet he uses tobacco and liquor, (only enough to be *sociable*), may be a good, thorough business man, you say—and society man too—which means that his recreations and rests are few, and *they* after nightfall, and on Sundays; consequently, midnight scarcely ever finds him asleep. The breakfast is late, a cup of coffee and a few mouthfuls, a hurried lunch at midday, and the heartiest meal at night—with the usual drink and smoke after each meal—and between it may be! His evenings are spent at theatre or club ball, or at a friend's. So you see what little *pure air* he gets is while going to and from business or amusements, and *that* usually vitiated by a cigar. This life is in every way unnatural, though common enough!

So will be his sickness and death quite common and yet unnecessary, had his blood been kept pure with fresh air and good food, exercise, and plenty of sleep—the latter is as useful to keep the body strong as proper food and sunshine. Oh, that I had the power of expression of a Dickens, or a greater, even, that I might arouse mankind to the *crime* of sickness! The late Mrs. E. W. Farnam, one of the most gifted and talented of women, once said, "I should be *ashamed* to have typhoid or any sort of fever, knowing it to be my own fault."

She was an enthusiast on health subjects, and a physician, yet she died from consumption, but caused by over-exhaustion in attending upon our sick soldiers during the war. Duty to others oftentimes precedes duty to self, and our best knowledge then avails others much, but *us* as nothing. Is it not a physical sin, when we deliberately keep ourselves ignorant regarding God's sacred laws of health?

It is so considered in the moral life, and surely God expects as perfect work from us, physically as spiritually. In the good time coming, when our doctors consider it their best duty *to teach* how to *keep* well, as well as to *get* well, and our ministers shall teach, as well as preach, that the gospel of health is as truly divine as the gospel of peace and good-will, then will there cease to be popular and fashionable inducements to destructive habits—tobacco using, costly dinners, midnight revels, tight lacing, and bad dressing, etc., etc. When intelligence becomes the rule, instead of the exception, and experiment has given place to knowledge as to the best and right way of living to promote perfect health: when children are *born* without perverted appetites and the seeds of disease, then we may hope for a race truly in the image of the Creator.

Deer Ridge Farm, Los Gatos.

Something New for the Sleepless.

Now, what is it that disturbs sleep? Noise? Not altogether, for the inhabitants of besieged towns have been known to sleep through the roar of bombardment, and to waken suddenly when the firing ceased. Millers will sometimes start up from sleep, awakened by the mere stopping of the mill wheel. The rattle of a train in motion will induce sleep, as all travelers know. And last, not least, the sleep of infants, the sweetest and soundest sleep of all, is promoted by sound. The popular view, then, that noise disturbs sleep, like most popular views, only touches the truth, but does not grasp it. The true cause of disturbance is interruption. Any sudden cessation of the continuity of silence or of sound awakens the sleeper; for sound, provided it be monotonous has precisely the same effect on the brain as silence. That simple piece of mechanism, the alarm clock, is based on the theory of interruption; it interrupts silence.

Now, might not an equally simple contrivance be made on the same mechanical principles, but with the reverse object, viz., that of insuring sleep by sound? Its utility, to delicate persons especially, would be undoubted. Call it the morphiometer, the somniferant, or give it a French title, and christen it in the garde-somne, or sleep-preserver—a name by the way, that would truly designate its object, for its real object would not be so much to promote sleep as to insure the sleeper against disturbance (and vulnerable side of light sleepers) by placing a bulwark of sound between him and the sudden shocks of extraneous noise. Let your sleep preserver produce the drowsy, monotonous buzz of the humming top, not so loud as to be heard in an adjoining room, but loud enough to drown distinct noises when placed close to the bed-side, or hung over the pillow.—*English Medical Journal.*

WASHING OUT THE STOMACH.—This operation, such a novelty a few years ago, is coming quite in vogue. A Maryland doctor employs the method very extensively in some cases of dyspepsia. The following is the *modus operandi*: A soft, red rubber tube is passed gently down into the stomach quite to the pylorus; with this is connected about a yard of common flexible tubing and a glass funnel, which is held on a level with the patient's breast, and tepid water is poured slowly into the funnel until a sensation of fullness is experienced; the funnel is then depressed to the level of the waist, and the fluid allowed to syphon out. The process is repeated until the water returns quite clear.

CAN HOT WATER DRINKING BE ABUSED?—*Good Health* says its use may be continued longer than necessary. It should not be continued longer than the conditions requiring it are known to exist. There are various conditions which indicate when its use should cease: Excessive irritability of the heart, causing palpitation; tendency of blood to the head, which is increased when hot fluids are taken into the stomach. Ulceration or extreme irritability of the mucous membrane of the stomach is another indication.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

AMADOR QUEEN.—*Ledger*, Dec. 23: At this quartz claim, under the direction of S. D. Shugert and James Morgan, operations are being energetically prosecuted, with every indication of proving the correctness of the theory which has been steadfastly adherd to by the best posted mining experts, that as rich deposits of gold as any heretofore discovered along the mineral belt repose beneath the crest of Murphy's ridge. Two Burleigh drills are used in the mine. The immediate work in hand is the running of two tunnels, one north and the other south, at the depth of 200 ft from the surface. Several pockets of that heavy black metal, carrying a large percentage of gold, and similar in every respect to the rich ore taken from the Mammoth, have been discovered lately, and the owners are naturally elated over the bright prospects. Considerable bodies of regular ledge matter have also been encountered, and the main object of the tunnels before named is to enable stopes to be opened, and mining prosecuted in a regular and systematic method.

MISCELLANEOUS.—The taking out of water from the Gover shaft is still in progress, with considerable work ahead before the bottom can be seen. Humphrey Rees has taken charge of the mine at Enterprise. The Plymouth Con. Mining Company have announced their nineteenth dividend of fifty cents a share aggregating $50,000 or $60,000 for the current year.

SUTTER CREEK.—At the Eureka the 200-ft sinking contract is within 40 ft of completion. Although the rock is rather hard, the progress made is considered very good. A few weeks more will see the sinking completed, when drifting will probably be started. A number of teams have been engaged to haul wood and other material. Mr. Stewart has also let a contract for the delivery of 400 timbers and other mining supplies at the Lincoln. W. A. Woodworth is the contractor, and will at once enter upon the work. Good rock has been struck on a mining claim between here and Amador City, managed by E. B. McIntyre, of this town, and principally owned by bim. The ledge is said to be two ft in width and prospects well,

Calaveras.

A BONANZA IN FACT.—Calaveras *Chronicle*, Dec. 20: The yield from the Bonanza claim, on Tunnel Ridge, S. S. Moser & Co., proprietors, has maintained its reputation for a paying institution during the last six months. From June 1st to December 1st the yield aggregated $12,000 or at the rate of $2,000 per month. How is that for an exhausted (?) mining region?

BONDED.—*Mountain Echo*, Dec. 20: The Pilot Nob mine, owned by Stickle and Bennett, adjoining the Gold Cliff on the north, has been bonded by a gentleman named Lane, the conditions being as follows: Lane is to have full charge of the mine for four months, at the expiration of which time, if he concludes to keep the mine, he pays the company $1,000, and in eight months more he pays $5,000 more, which is the price agreed upon for the mine. We understand that a whim is to be erected on the Pine Log mine in Salt Spring valley. The shaft is 75 ft deep, and the mine looks well. A shaft was also started on the Ryal mine, owned by the Pine Log Mining Company. It is the intention of the firm to sink a shaft a hundred ft deep, and drift to the vein.

Inyo.

PROSPECT.—*Independent*, Dec. 20: A very good prospect is now open to Mr. H. A. Man, in his mine at Redding canyon, on the east side of the Inyo range, and not far from the Poleta mine. A quantity of the ore was worked recently, and the bullion shipped to Selby & Co., San Francisco. From less than one ton of ore the total yield was $78.60. Many pieces of ore brought from the mine are very rich in free gold, and there is a large quantity of ore in sight. The probability is that Mr. Man has found a valuable mine,

Kern.

A BONANZA.—*Californian*, Dec. 20: There is good reason to believe that Messrs. Webb, Hirshfeld & Co., have struck a great bonanza in the Long Tom mine. Those who have been familiar with this mine from the time of its discovery, and were acquainted with the extent and characteristics of the first bonanza struck by Roberts & Co. have no doubt of the fact, and that it is even richer and more extensive. The popular belief is that the first one yielded not far from $500,000, and everything connected with the present one is of a more promising and assuring nature, including the ore itself; but the fortunate owners do not permit themselves to become excited. As they have done in the past, they will continue to work with a close eye to economy. One of the firm is now in San Francisco, procuring steam-pumping machinery. Although it is not likely from the nature of the formation to ever be a wet mine, and the amount of water to be raised is small, the company have wisely concluded to put in the most approved pumping machinery as the cheapest in the end. Their mill is of ten stamps, but they will not add to it unless it may be some process for treating the sulphurets, which various assays have shown to be surprisingly rich. They are men who deserve their good luck, and we sincerely hope their bonanza may turn out even better than it promises.

Nevada.

PROSPECTS OF A GOOD MINE.—Nevada *Herald*, Dec. 20: The quartz mine owned by John Curry and R. E. Robinson, situated near Rush creek, about three miles west of town, continues to look well and gives every indication of developing into a good paying property. At the bottom of the shaft, which is 90 feet in depth, the ledge is 18 inches wide and is between slate and granite walls. The quartz taken from it has a rusty looking appearance, and contains considerable sulphurets and galena. Free gold can be seen in many of the pieces, Miners who have examined the rock estimate that it will yield in the neighborhood of $15 to the ton. There are 30 tons now on the dump ready to be crushed. Besides this there is a considerable quantity of rich ochre, which the ledge carries with it. The owners expect to make arrangements soon for the erection of a small mill, and thus save the expense of hauling their ore three or four miles. A new shaft is being sunk to tap the ledge at a point where it is known to be much wider than in the present shaft.

GOOD QUARTZ.—Grass Valley *Union*, Dec. 20: A cleanup of quartz has just been made, of 20 loads of quartz from the Horse-Shoe mine on Wolf creek, which gave a yield of $31 per load. This did not include sulphurets or a cleanup of the pans. The rock with the exception of two loads, was taken from the shaft, and contained considerable waste. A level is now being opened at the depth of 125 feet, and the ledge is showing of good size and quality both in the drift and stope. The owners in the mine feel much encouraged over the prospects and will continue to push the work vigorously.

OUR AURIFEROUS WEALTH.—*Transcript*, Dec. 20: The average gold yield of Nevada county mines ranges from three to four million dollars per year, and the developments made in quartz during the past two or three years give promise that the output will soon be increased from a third to a half of that sum. All this is, and always has been, done quietly, without a flourish of trumpets or other disturbing demonstrations. The Comstock goes up like a rocket and comes down like a stick; Bodie district blossoms and fades as does the gorgeous flower; the Reese River and Cœur d'Alene family gleam forth like meteors in a clear sky, and almost as quickly do they pass from our vision. During all this time old Nevada county forges bravely ahead, pouring into the lap of the nation a steady stream of the royal metal, the source of which is as lasting as the mighty mountains.

Placer.

CLEANUP.—Placer *Herald*, Dec. 20: Samuel Kaiser and P. Lozano, had a cleanup this week from a mine they have been working recently near Crater Hill, and the amount realized indicates that they have a good location. Report comes to us direct that Ferguson & Hardy have struck rich rock this last week in the old Good Friday. It is more than a year since these parties started in to reopen this old mine, and all the time their faith in finding pay rock has never abated. If the pay they have found is like that which characterized the Good Friday in its earlier history, the boys will soon be in circumstances.

Plumas.

CHAMPION MINE.—Greenville *Bulletin*, Dec. 20: This prospect is situated nearly north of town about a half of a mile, and is owned by Jack Lowry. It is adjoining the ground of the old Bullion mine, which was worked years ago, and paid well, even in those days, the ore yielding $10 and $12 per ton. Mr. Lowry believes the Champion to be a continuation of the Bullion. He has gone down about 40 feet on the ledge, which dips 40 degrees north, and is three and a half feet in width. Thus far no blasting has been necessary. Mr. Lowry showed some very nice prospects obtained from the quartz. For 300 feet the croppings yielded gold. Mr. Lowry is a poor man, but we hope he shall be able to work the mine properly, and thus reap the benefit of his "find."

Sierra.

MILL PURCHASED.—*Mountain Messenger*, Dec. 20: Mr. Gardner, of Poker Flat, has purchased of Mr. Forbes, one of his quartz mills, and was over with mules a few days since to pack it home, but the storm coming on, he was afraid to start with it. He has a very rich quartz ledge, some of the rock going as high as $11 per pound, crushed in a hand mortar. Assays have gone as high as $2,100 per ton.

RICH ORE AT THE ALASKA MINE.—The Alaska mine, at Pike city, is doing very handsome things by its owner. Quite recently $30,000 worth of specimen ore was hoisted out of the Alaska shaft in one shift. People are not to infer from this that the vein in that mine is rich only in spots. Of course, such strikes as the above are not of every-day occurrence, but they have been reported before during the period that that mine has been worked. While such is the case, however, the general run of the ore that comes from the ledge is of high milling quality. The Alaska is one among the few mines in this county that has had any sort of half-way prospecting. There are quartz claims scattered all over our county now lying idle, that would prove profitable investments if the right kind of parties would take hold of them. The Golden Gate, formerly the Oriental mine, at Alleghany, is a good example of the class referred to. That mine, worked to a depth of somewhere near 300 feet, turned out as far as known, in the neighborhood of $200,000. If that mine was owned in Sierra county, instead of New York, it would be doing our people some good, as well as the owners, who would not allow such a valuable piece of property to stand idle. This is only one among many instances of the same sort that we might call attention to.

San Bernardino.

ALHAMBRA AND GOLCONDA.—*Calico Print*, Dec. 21: Not much work has been done on the Alhambra and Golconda for the last few months. A few men have been employed prospecting under the supervision of Mr. Rogers, an able expert, and he has obtained a very good knowledge of these mines, and has found a number of locations where it will pay to sink and develop. He feels confident that there is an immense quantity of ore imbedded within the limits of the Alhambra and Golconda, which is of a grade that will pay handsomely. Rich pockets can be opened up in these mines, as well as in those adjoining. Some five or six tons of ore were recently assorted to make a grade more than an average, and last week a ton of it was taken to the Alhambra mill, at Hawley's, for a test. It yielded about $250 in bullion. The rest of the ore was shipped to San Francisco, and it is expected it will return about $200 per ton. It has taken some time to arrange the business matters of the Golconda Mining Company, so as to be agreeable to all concerned. According to the latest report from the managers, matters have been arranged quite satisfactorily, and there is a prospect of resuming operations on these mines on a large scale.

A RICH STRIKE.—A rich strike was made a few days ago in the Silver Odessa. A three-foot vein of ore has been uncovered that is heavy with black metal. It appears to be not a small pocket only, but a well-defined vein that can be traced for some distance, and should it continue 100 ft, and as rich as it is at the point struck, it would yield thousands of tons of bullion. But aside from the rich strikes that are being made in the mine so frequently, there are many tons of ore that will average from $50 to $75 per ton, and instead of showing signs of exhaustion, it increases in quantity and quality. The prospects of this mine are very bright. Since writing the above, we were informed that a sample from the newly discovered vein assayed $16,000 to the ton. Work progresses on the Sue mine as usual. A large quantity of sacked ore is being hauled from the mouths of the various shafts to the head of the tramway and let down to the ore dump. The new boarding house was opened this week. A few days ago a rich strike was made in the Bismarck, at a depth of 60 ft. This mine, on an average, is looking better than ever. A few days ago, at the constable sale of the Snow Bird mine, the property was purchased by B. E. Fink & Co. Operations on that mine will now receive an impetus that will result in a considerable increase to the already important bullion output of the camp. The Barber mill has been in operation at intervals during the past week, to test the machinery and get everything in good running order before commencing on the hundreds of tons of ore piled up on the platform. E. A. McDuffee is busy hauling ore to the Daggett sampling works. Jos. Le Cyr has the contract for hauling ore to the Barber mill. He has just built a large barn for the shelter of his stock, near the mill. S. Hart, of the firm of Logan & Hart, owners of Sam Houston and Blackfoot, are still in the district superintending their mining operations. A few tons of fine ore from their mines were recently sampled at the mill in Daggett. About 1,300 pounds sampled over $2,300 to the ton.

Trinity.

NEW RIVER.—Trinity *Journal*, Dec. 20: Mr. E. M. Wallbank, representative of the C. P. R. R., whom we mentioned last week as having passed through here on a tour of inspection to the new quartz mining district at New River, returned this far on Wednesday last. He spent two days in at the mines, visiting the many ledges which have been discovered and making note of the developments, which mainly consist of tunnels on the lodes of varying lengths, from 50 to 160 ft and of shafts 100 feet and less. He prospected rock from about a dozen of the mines, and in every instance got a splendid prospect. The district, in his opinion, is the richest and most extensive ever discovered on the coast, and cannot but induce a large mining immigration and much prospecting next spring. The route via North Fork and Rattlesnake, he says, is not only the most practicable, but the road necessary to construct to reach the mines from the point last named is one which can be easily and cheaply constructed. A little work between Junction City and North Fork will place the present road in good condition for heavy teaming, leaving but 40 miles of packing from North Fork to the mines, which can readily be made in two days and a half, by loaded pack trains, and in one day with saddle animals. In conversation with gentlemen at New River, who had traveled both routes, he found their preferences always in favor of that to Weaverville, as against the one to Arcata and Eureka, even with former Humboldt county men, who would naturally be prejudiced in favor going the other way. Mr. Wallbank will report at length to the railroad company upon his observations.

MORE QUARTZ MINES.—County Superintendent Given returned a few days ago from visiting schools in the Southern portion of the county. He informs us that James Graham has discovered two good ledges in the bed of the South Fork, one of them six feet in width. Both are rich in sulphurets carrying gold. G. W. Barnes has a six-foot ledge on the South Fork mountain, which shows well in free gold, and assays high in both gold and silver. The rock is much copper-stained. A mill will be erected in the spring. It is well known that South Fork mountain contains much iron and copper, and indications point to a bonanza of the more precious metals. A large number of prospectors from Lake and Mendocino counties will visit that section next summer. Luke McDonald was in from Deadwood this week, and tells us that everything in the quartz mining line in that district is flourishing. From others we learn that the mine owned by McDonald Bros. & Franck pays its regular $1,000 per day—a nice yield from a five-stamp mill, independent from the sulphurets, which are heavy and rich. It is stated that no less than $100,000 has been taken out since the mill was started up a little over three months ago.

TRINITY AHEAD.—Jacob Hershberger, a former resident of New River, arrived here Thursday evening from Waterman, San Bernardino county. He will go to East Fork at once and prepare for prospecting as early in the spring as weather will permit. Experience gained elsewhere has convinced him that there is no richer quartz section anywhere than that lying between the mines on East Fork, and those at the head of New River. He says the Trinity boom next spring and summer will exceed anything ever before experienced in this section, it now being the universal topic among miners wherever he has been.

Tuolumne.

AT WORK.—*Union Democrat*, Dec. 20:—Active operations continue in the Buchanan, Dead Horse, Lamphier, Alabama, Heslep, Willfatta, Oakland and Soulsby quartz mines. There are other mines being worked from which we have no account. The tunnel of the Stanislaus River Mining Company is in about 200 feet, which when completed will turn Stanislaus river leaving about two miles of the river bed dry, work is constantly progressing. The tunnel to open into the Bonanza mine is also going ahead with reasonable speed.

JIM GILLIS and Tom White are taking out 100 tons of rock from the croppings of the Marryatt mine at Tuttletown. A crushing of the same material a short time ago paid very handsomely.

GOOD.—Tuolumne *Independent*, Dec. 20: We hear, from the best authority, that the old Soulsby mine is doing splendidly—$40 to the ton. We learn that the old Eagle mine, at Jacksonville, on the Mother lode, which was sold for $300,000, is now bonded to Charley Tozier.

QUARTZ MOUNTAIN MINES.—Cor. Tuolumne *Independent*, Dec. 20: The "App" mine, at Quartz Mountain, is situated to the west of the "Boulder vein," on the mother lode of California. This mine has gone through many vicissitudes during the past 30 years of its existence. The mine, etc., was attached, and for a long time was closed down. The shaft filled with water, the hoisting works and mill went to decay, and eventually reverted to the original and present owner. The works alluded to are placed on the south end of the mine. During the year 1884, now just closing, Mr. App and his pard, Mr. Waller, arose from their past lethargy, and made a big effort to resuscitate their property, but this is always a difficult task for poor men to accomplish. So, having no other resources but brain and muscle and a thorough knowledge of their mine, they set to work in good earnest prospecting the north end on the surface. They sluiced off a portion of the ground to the west of the "Boulder vein," which paid them good wages. This simple process laid bare the ledge matter, with its strata and segregations of quartz veins. The ground in question is rising ground, on a small hill, which they commenced to "breast" into, carrying it some 20 ft wide, feeling satisfied, by their prospects, they had a pretty good thing if they only had a mill. This, with their indomitable pluck, they succeeded in putting up—five stamps. The necessary stamps, etc., they procured from the old wreck on the south end; built a mill-house, water-wheel, and have this day a most creditable little mill, drawing their crushing material from the open excavations on the north end of the mine. These open works have, so far, been very profitable. We were shown where they took out $500 in three days from a little pocket in the "gouge" portion of this stratified mass. There is no doubt but that a very valuable channel of ground exists on this portion of the mine. We examined the solid quartz matter and pronounced it first-class ore. The deeper they get on to it in the hill, the better it looks. They have just finished a crushing of some thirty odd tons, for $16½ per ton, which is needless to add pays very handsomely, as the mill is close at hand, and the ground easily worked—can be mined and milled for $1.50 per ton. Their present aim is as follows: To save sufficient coin from this end of the mine to enable them to re-work the old north shaft, take the water out, and to open up the long hidden treasure that they well know exists there. When the water is out and hoisting works placed in situation, this will be one of the most valuable properties on the coast. We visited the Quartz Mountain mill—"Old Heslep mine." They are running 20 stamps, from rock taken from the south end of the mine, which pays well. The company's superintendent, Mr. Bowman, is sinking his north shaft as rapidly as he can, but at present is in very hard ground, costing considerable per foot. He is also making repairs to his mill, resetting mortars, etc., which is done by degrees, so as to keep twenty of the stamps always running. We then went south, to Poverty Hill. It seems sad to see the total and stranded wreck of the Golden Rule mine—a good mine if only opened up. A few remarks on the "Fitzgerald Bros." mine:" We found the boys had sunk two shafts, one 65 ft and the other 40, about 60 ft apart—both connected by a drift. Their vein matter consists of a series of small stratifications, between the walls, in beautiful blue metallic slate. Gold showed on the dump. Some of the small strata carried very rich ore; gold was coarse. Pestle and mortar is their mill. The free gold made in that way pays good wages; the balance of the vein is sorted. This last crushing yielded over $40 to the ton in custom mill. This is clear profit. We did not consider the property a company proposition, but a splendid thing for the boys who own it.

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, Dec. 20: The main incline winze is down to the 3000 level. The ground at that point is dry. As soon as the new hydraulic pump goes into operation at the joint shaft (the Combination), a drift will be started from the working station of said shaft to connect with the bottom of the winze. By means of this connection an excellent circulation of fresh air will be secured. On the 2800 level the west crosscut is now out about 40 feet. It is in a fine metal bearing quartz formation. Assays of from $5 to $10 are obtained in this quartz body.

COMBINATION SHAFT.—The new hydraulic pump at the 3000 level will be running by Christmas. A tank station has been cut out on the west side of the station in which the pump is being set up, and in this has been constructed a tank that will hold 40,000 gallons of water. As soon as the pump is in regular working order a drift will be started west on the 3000 level to connect with the Hale and Norcross winze, which has now reached said level. This connection will give a fine circulation of cool and fresh air.

UNION CON.—All the machinery, car tracks, air and compressed air pipes have been hoisted out from the 3300 up to the 2700 level. The water has risen to the 2800 level. On the 2700 level they are now cleaning out and repairing the main south drift. On the 2300 level they are also cleaning out and repairing the south drift. On the 2500 level the joint east drift is being reopened and repaired.

OPHIR.—Low grade ore is still being extracted from the fillings of the old drifts on the 250 level. On the 500 level the west drift is fast nearing the old workings and the ground is growing better; does not swell as did much of that recently passed through. On the 1500 level a winze is being sunk at the end of the west cross-cut from the main south drift. For work joint with other north-end mines see what is under the head of Union Con.

SAVAGE.—The E-street tunnel is now within about 60 feet of the point where it will encounter the northern continuation of the ore body that worked in the Hale and Norcross. They have recently been passing through a very heavy body of clay (doubtless the east clay of the vein) which, from its swelling, has given much trouble, but are now in a more solid formation.

ALPHA.—Explorations at several points are being made in the large body of quartz lying between the 600 and 900 levels. Spots of ore assaying as high as $60 have already been encountered in the quartz for-

nation which is over 100 feet wide. What lies below the 900 level in this ore body of quartz remains to be discovered. Thus far the work has all been above that point.

CON. CALIFORNIA AND VIRGINIA.—The northwest drift on the 1750 level night before last reached the old workings to the northward of where the fire broke out in the old timbers some years ago, and they began taking out ore that is being brought to the surface for reduction. As yet this ore will not pay a very large profit, but they are liable soon to find something better. It is pretty good to know that at the first point where it was reached the ore was good enough to save for crushing.

MEXICAN.—All the machinery from the 3300 to the 2700 level has been hoisted out and the water allowed to find its level. Yesterday the water had risen to the 2800 level. Repairs joint with the Union Con., looking to the resumption of work on the upper levels, are being made. The water rose from the 3300 to the 2900 level in 90 hours.

SIERRA NEVADA.—In accordance with the new departure, the pumps, car tracks and air pipe have been hoisted out from all points below the 2700 level and the water allowed to rise.

ALTA.—The water has been allowed to find its level, which will probably prove to be at the drift leading out into the Sutro tunnel at the depth of 1,030 feet below the surface. Prospecting operations have been resumed on the old 1000 level, where some years ago a considerable deposit of good ore was worked.

BEST AND BELCHER.—The west cross-cut on the 825 level at the Gould and Curry north line is still in vein material of a very promising appearance. It has yet a long distance to go to reach the west wall. Some of the feeders of quartz encountered give low assays.

GOULD AND CURRY.—On the 825 level the west cross-cut at the Savage north line is still finding occasional streaks of quartz that give low assays. A large area of ground remains to be explored.

SCORPION.—On the 500 level the north drift continues in vein porphyry, with occasional streaks of quartz and small seams of clay. Not much water is encountered.

YELLOW JACKET.—The work of extracting low-grade ore on the upper level proceeds as usual and the mills on the Carson river are kept running to their full capacity.

ANDES.—Work on the 500 level will be resumed in a few days, as the gas from the fire in the old Central tunnel is disappearing from the drifts.

OVERMAN.—Sufficient low-grade ore is being found in the old upper levels to keep a small force of miners employed.

UTAH.—East cross-cut No. 1, from the main southeast drift on the 1950 level, is in hard-blasting vein porphyry.

BELCHER.—About the usual amount of low-grade ore is being extracted and sent to the mills on the Carson river.

CROWN POINT.—About the usual quantity and quality of ore is being extracted and sent to the mills.

Columbus District.

MOUNT DIABLO.—*True Fissure*, Dec. 20: The north cross-cut on the sixth level is in 73 feet. The west drift on the fifth level has advanced 10 feet and the face shows some $40 ore. The upraise from this drift shows a little ore of good grade. On this level, near the winze No. 1, work has been started on some ore and there are now 18 inches of $70 ore showing, that looks promising. The intermediate, between the fourth and fifth levels, is yielding some $50 ore. Some $90 ore is being taken from a promising looking streak east of the shaft and between the second and third levels. Between the same west of the shaft, the stope shows 18 inches of $150 ore. Some ore of good grade is being taken from the second level. The intermediates, between the first and second levels, are giving some $70 ore from several small stopes. Some good ore is being taken from the east drift on the first level and also from the "big stope" above this level.

Ely District

ACTIVE MINING.—Pioche *Record*, Dec. 13: There appears to be a feeling prevailing among many here that active mining operations will be resumed throughout the neighborhood next summer. The cause of the creation of this formation we know not, and we hope that none will be disappointed. We have a mineral belt here that is unsurpassed by any int he great inter-mountain basin. Scratch the ground where you will, one generally finds the precious metals. There are prospects here, in fact many developed mines, with large quantities of ore exposed to view, that are now lying idle, all for the want of a little capital. Wait till the railroad gets running through this country, then she will boil; then all our mine owners will be able to build postal telegraphs and ocean cables, and keep them exclusively for their own use. Never has there been so much assessment work done on mines in this section as there is now being done. The mine owners have turned out in full force and are either doing, or having done, assessment work on their mines. They all appear to have perfect titles and intend to keep their properties in this shape. Many very encouraging reports come in from the different localities, and may they all be successful in securing rich properties.

CONTRACT LET.—The contract to sink the shaft of the Mendha mine 100 feet deeper was awarded to Grant Porter and Pete Owens. The contract was let, so rumor states, for about $17 or $18 per foot. The contract calls for the completion of the work in 60 days, from the 11th inst. Two shafts will do the work, and the men started out to the mine with supplies on Thursday.

Eureka District.

SPLENDID ORE.—Eureka *Sentinel*, Dec. 20: Capt. Foley is elated of the prospect in his mine, the Last Rose of Summer, which is near Judge McLaughlin's mine, the Irish Imbassinder, on the north. He showed us a specimen of ore from it yesterday, a sort of chloride, probably, which assays $2 to the pound ($4,000 per ton) in silver. The Captain deserves a bonanza. He is one of the most faithful and intelligent miners on the Pacific Coast.

EUREKA CON. WORKS.—On Sunday morning the Eureka Con. furnace, that had been shut down for a day or so for repairs, started up in fine condition and with greater facilities for reduction. The rumor of a permanent stoppage of work, we are glad to announce, says the *Sentinel*, had no foundation in fact. Just now more men are employed about the works than usual, as an accumulation of fine dust is being collected and run through.

Mount Cory District.

THE MOUNT CORY MILLS RESUMED.—*Enterprise*, Dec. 20: The repairs to the Mount Cory mill, at Coryville, have been completed, and the mill was started up last Wednesday. Pending repairs a large amount of ore is said to have accumulated at the mill.

Taylor District.

GOOD REPORTS.—Pioche *Record* Dec. 13: Good accounts are brought over here from Taylor district. It is said that the mines never showed any permanency till the present time. The mines of both the Monitor and Argus companies have large bodies of rich ore in them. The Monitor Company is preparing to sell out to a party of capitalists, and Frank Drake and others have been examining the property.

Tuscarora District.

BELLE ISLE.—Tuscarora *Times-Review*, Dec. 18: The usual progress has been made with the work, and there is no material change to report.

NORTH BELLE ISLE.—Drift north, on the 70-foot level, has been extended a total distance of 91 feet. Progress for the past week six feet.

GRAND PRIZE.—Work has been resumed in the south drift in the 400-foot level. Stopes are produced as usual. Mill shut down this morning temporarily.

NAVAJO.—Upraise south of No. 3 cross-cut, 150-foot level, has been carried up a total distance of 46 feet. The ore at this point is of good grade, and the stopes along the line of this level are showing a good width of ore. Stopes on the 250 foot are yielding the usual grade and quality of ore. Cross-cut east, 350 foot level, has been extended a total distance of 42 feet.

Willow Creek District.

FLOURISHING.—*Silver State*, Dec. 20: Joe Kirby, of Willow creek district, reports everything in a flourishing condition in that vicinity, and the miners and prospectors greatly encouraged by the steady improvement that is constantly taking place. All the properties being worked are showing well, and the prospects for the camp could not be brighter under the circumstances. All the work performed is of a prospecting character, merely to prove the value and extent of the ore bodies, and to place the mines in shape for working a force of men whenever it is necessary to do so. The Ohio mine is looking well and improving as work progresses. Willow Creek will certainly command attention before another mining season passes away, if improvement still continues to be a feature.

COLORADO.

NOTES.—Colorado *Mining Gazette*, Dec. 20: The Humboldt is the largest producer in Bullion camp. New hoisting machinery is being put in place on the Joe Reynolds, Messrs. Ben Hensley and party are making good progress on the Range Line mine. Field & Co. have the stamps in place in their new mill being erected on Chicago creek. The Rudbergh Brothers are getting out high grade ore from their Argosp lode, Bullion camp. Owen & Co., lessees on the Joe Reynolds No. 2, shipped three cars of ore during the week. The Holland company, on the Free American extension, have just opened a fine vein in their crosscut. Put & McMahon have a large quantity of good grade ore ready for shipment from the Free American. The Red Elephant Mining company has renewed work on the Schwartz shaft, intending to sink 300 feet further. The elevated tramway from the Champion mine to the company's mill, at the entrance to Fall River, has been completed. The Kohinoor and Donaldson Consolidated have resumed sinking the main shaft on the Champion mine on Belleview mountain. Jackson, O'Brien & Co., on the White mine, Red Elephant mountain, have seven or eight inches of good ore, and are shipping monthly. The Snyder Brothers, of Breckenridge, are at work on their Andrew Lowe mine, in Ohio gulch, near Dumont. They are in good pay. The amount of ore received at the Public Sampling works is increasing weekly. The output per month will reach 600 tons in the near future. Farris & Co. shipped two large lots of ore from the Joe Reynolds mine to the Idaho Sampling works this week, and have another shipment ready. Messrs. Gallagher, Measone and Emanuel have nearly completed their contracts on the mining property owned by Governor Bryan on Ute creek. Van Syckle & Co., lessees on the White mine, Red Elephant mountain, are working on a good pay streak, the first-class ore running 230 ounces in silver. McFarland & Co. have a large force at work on the Donaldson mill, hurrying it to completion as rapidly as possible. When completed it will be the model mill of the State. A new shaft house 14x24 ft has been erected on the Mary Foster lode, on Ute creek. The lessees are taking out large quantities of ore that runs $400 per ton. The pay streak is from six to ten inches wide. R. S. Put has four feet of scattered ore and about five inches of a solid streak, on the third level ot the Free American extension, the first-class yielding 262 ounces in silver. He has a large lot ready for shipment. A large and rich strike was made on last Tuesday in the Dew Drop mine, situated on Fall river, and owned by Colonel Thomas E. Irvine. In the face of the lower level in the upper workings, four inches solid of honey-comb quartz was exposed, which carries free gold. The ore mills as taken from the mine without sorting from $200 to $253 gold per ton. The pay streak widens as the work of development progresses.

CLOSED.—Idaho Springs *News*, Dec. 25: The smelting works at Argo, and Grant Works at Denver are about closed down. No coal to be had on account of the striking miners. They have issued orders to the sampling works to curtail buying ores. This will make some difference in Clear Creek's output for 1884. It will be the means of closing down a great many mines and throwing men out of employment, all of which begets hard times.

IDAHO.

THE COEUR D'ALENE COUNTRY.—*Inter-Mountain*, Dec. 19: E. Rannelmeyer, of Rannelmeyer & Co., placer mine owners at Murray, Coeur d'Alene district, spent Thursday in Butte. Mr. Rannelmeyer says that since the wild-eyed stampeders who knew nothing about mining left the camp it had been doing pretty well. Those claim owners who had the sand to stay with the Coeur d'Alenes had generally done fairly well. But most of the work, he said, is now shut down for the season, with the exception of that being done in the drifts. He and his partners own two creek claims and two on the bar. They have had five men employed, and the work has paid per day over $5 to the man. The nuggets he had with him were taken from their diggings. One was worth $45 and the other about $20. He saw no reason for expecting anything but a good outcome for the country. The only thing which seems to stand in the way at present is the lack of water sufficient for the requirements of all the camp. This disadvantage will be partly done away with by the 1st of next May, when two ditches bringing in a large quantity of water from some distant supply will be completed and Mr. Rannelmeyer estimates that sufficient ground will then be opened to give employment to 1,000 additional men (there are now some 600 or 800 in the district).

THE LOCAL CONCENTRATOR.—Wood River *Times*, Dec. 20: There is one thing that the miners and prospectors whose claims are within hauling distance of Hailey can be assured of, now that the Hailey Concentrating Works are in successful operation, and that is, an all-year market for their ores. It matters not how low the grade of their rock—if it is only ore, and not waste—they can get it in shape for immediate sale within a few days by simply hauling it to the works. This will almost entirely remove the obstructions hitherto in the way of working our mines during the winter, and a great impetus should thus be given to the opening up of our productive properties.

CAMP CREEK.—James Gunn, president of the Bullion Miners' Union, who has been working on his claims on Camp creek for a while, was in town yesterday, laying in winter supplies. Mr. Gunn reports the Big Camas, Treasure Box, Good Hope, Blue Bird, and other Camp creek mines opening up very encouragingly, and he expects that region to become quite noted in the near future. If the mill talked about by the Big Camas people is built next spring, a booming camp will doubtless spring up in that vicinity. The ore there is of a good medium grade, ranging from $25 to $150 per ton, and can be easily concentrated. It carries gold and silver and some lead—just enough of the latter to make it fairly good roasting ore. The ledge in the Treasure Box, which Mr. Gunn owns, is from four to six ft in width. About 12 men will work in the district all winter.

MONTANA.

NORTHERN PACIFIC SHIPMENTS.—Helena *Independent*, Dec. 20: The following is the report of Mr. Jackson, connected with the Northern Pacific Express Company, showing the amount of silver bullion and gold shipped by that company from December 1st to December 13th: Seventeen bars of silver amounting to $22,600, and twelve boxes of gold amounting to $101,674.14, which averages in gold shipments at $8,472.85 per day. This is a showing of the mineral shipments, of which Montana should be justly proud.

A GOLD BONANZA.—*Inter-Mountain*, Dec. 19: In conversation with Fred Anderson, a reporter was informed that the development in the Berlin mine, discovered a few days ago by August Anderson, brother of Fred, is being actively prosecuted, and so far there is nothing to indicate a discontinuance of the wonderfully rich ore streak, from which assays have been had running all the way up to $80,000 to the ton. Some samples of the ore were exhibited to the reporter and they showed free gold in great profusion, the ore being in some cases literally covered with the shining wealth for the space of an inch or more. Mr. Anderson says the shaft on the Berlin is only down about 35 ft, and neither wall has yet been found. They have about two ft of good ore, with occasional streaks of the wonderfully rich gold-bearing rock mentioned above. Mr. Wartenweiler, of the Lexington, has contracted with the discoverers to expend $10,000 in exploring the property, for a one-fourth interest in it. The Berlin mine is situated in the foothills just west of the Big Hole river, and about four miles this side of Melrose.

THE ANACONDA SWANSEA.—Anaconda *Review*, Dec. 16: Between 30 and 40 cars of ore are hauled daily from the mine. The ore house, which has a capacity of 5,000 or 6,000 tons, was less than one-third full yesterday. The original smelter building is being remodeled to some extent. Among other improvements, a railway track will be run through it. The new smelter building is being fired up. Six matting and the two calcining furnaces had fires in them yesterday, and the remaining six furnaces will be fired up this week. Twenty-six furnaces will then turn out matte. Grading for the new smelter building, which will be 200 ft in length and have 16 stacks, is well under way. No building will be done this winter, however. The furnaces at present in use require as fuel between 100 and 120 tons of coal and 80 cords of wood daily. A new generator, to supply 20 additional U. S. electric lights, will be in place in a few days. This will, with the present lights, give a total of forty in and around the buildings. The engine room is being covered with iron roofing. On the new smelter building the roof is all on except about 100 squares. To cover the building entirely requires 800 squares. The present works have a length of over 800 feet. With the erection of the new building in the spring, which will be 396 feet long, the entire length of the building will be over 1,000 feet. There is a perfect network of railroad tracks in and around the buildings. Trains now run into the ore and coal houses, the old smelter building, the matte house, and the iron is down to the entrance of the new smelter building. The 16-inch turbine wheel in the matte house, which furnishes power to run the matte breakers during the day, is utilized at night to furnish power to run the electric generator. All the new stacks for the matting furnaces are topped out with fire brick. Yesterday was pay day, and the handsome sum of $97,750 was paid out to employees of the company.

NEW MEXICO.

LAKE VALLEY.—Cor. Rio Grande *Republican*, Dec. 19: On Monday last, 19 cars, containing 18 tons each, were loaded at the mines for shipment to Pueblo. From the Sierra Apache Co.'s mines about 75 tons of iron ore goes to Pueblo daily, to be used as heavy flux. These shipments are rapidly clearing the dumps of ore. The stone-coal trouble, East, is likely to prove a great inconvenience to large mining operations in Southern New Mexico. The rumored strike among the coal-miners is all a fudge, as nowhere is it understood that they are demanding higher wages. The coal-miners' union have so manipulated the coal shipments in the interest of certain railway combinations as to deprive this section of country of coal, by the carload, for the next six months at least. It is said that the Denver and Rio Rrande road has secured a "corner" on coal, to the extent of cutting western coal out of the markets of New Mexico, attempting, by their manœuver, to force the coal hauled by that railroad combination on us, at their own figures.

LEAD.—Silver City *Enterprise*, Dec. 20: Ed. Orr has contracted with the Kingston smelter to furnish that institution with a large quantity of lead ore from his Cook's Peak property. Rascom Bros. and Newcomb have a large quantity of ore at their Bear mountain claims, which they are preparing to ship to the concentrator. The ore is mostly low grade, but will pay handsomely to concentrate. O. J. Case, an old-time prospector and mining man, well known in this section, recently made a very rich silver strike near Gold hill. Development work is being prosecuted rapidly on the property which gives every indication of permanency. Messrs. Rountree & Farrell, the leading merchants at Carlisle, have bonded the Pennsylvania mine, which property J. A. Moore and Nate Scarritt, of this city, are large owners in. A force of men have been put to work upon the property, and it is stated that a large body of mineral has been encountered. Mr. Moore has charge of the development work. J. N. Evenson recently made a discovery upon his old Victoria claim, in Shakespeare, that upon having tested somewhat suprised him. A blind lead was uncovered by the recent storm, showing a small streak of ore, that, being stripped and sunk upon, widened to four inches, and assays $100 per ton. It is foreign in character to any mineral ever before discovered in the camp, and Mr. Evenson has confidence enough in it to continue work upon it.

SOLID MAN'S CAMP.—Cor. Silver City *Enterprise*, Dec. 20: The camp is situated on Big Dry creek, about eleven miles east from Pleasanton, at the base of Big Baldy, the most prominent peak of the Mogollons mountains. The district is named Wilcox, after a man by that name who prospected in this section of the country and was afterwards killed at Keller valley in an Indian fight. There has been about twelve locations made in camp, the most promising, as far as present development and surface showings would indicate, are the Solid Man, Socorro Chief and Uncle John, which are all located on the same lead which can be traced for 9,000 ft. The exact width of the vein has not been ascertained as yet. A tunnel is being driven on the Solid Man which cuts the ledge at the depth of 75 ft, and at the present time 11 ft has been cut in on the ledge, and there is no appearance of the hanging wall. The ledge, at the lowest calculation, is 30 ft in width. On the foot wall there is a talc gauge about 2 ft in width, which is also impregnated with mineral. There is an open cut on the Socorro Chief 20 ft in width showing mineral all the way. The Uncle John also has an open cut 15 ft. by 10 ft in width, with not one particle of waste in it. The ore dumps look immense for the amount of work done. The general formation is granite, quartzite and porphyry. The ore closely resembles that of the Carlisle. Parties thoroughly acquainted with Carlisle ore say it would be a difficult matter to detect any difference whatever. The assays which have been made so far give very encouraging results. A living stream of water flows within 50 feet of the mines, sufficient to afford water-power for a 50-stamp mill. The surrounding hills are thickly covered with pine, oak and ash. Very little prospecting has as yet been done in this district, and good chances undonbtedly remain for energetic prospectors. There is an abundance of game and fish in the vicinity.

UTAH.

REVIEW.—Salt Lake *Tribune*, Dec. 19: The week has been rather a stormy one, but the weather has by no means been severe, and the mining output has been at fair activity. The shipments of the metals for the week ending Saturday, December 13th, inclusive, were 57 cars of bullion, 54 cars of lead, one car pig lead—an aggregate of 112 cars. The receipts of bullion and ore in this city for the week ending December 17th, inclusive, were: Bullion, $127,864.13; ore, $25,696; total, $153,560.13. For the prior week the receipts were $109,985.30 of bullion, and $15,388 of ore, an aggregate of $125,373.30. The output of Horn Silver for the week was 23 cars of bullion, valued at $57,500, bringing the total for the year up to $2,717,000. The week has been a lively one in the affairs of this company, the superintendent at this end of the line having said that, if certain things came about, he will recommend the closing down of the mine. The Crescent sent down two lots of ore—$3,850 during the week. From Silver Reef the receipts of the week were $6,580 in silver, being three bars, $3,980, from the Christy, and two bars, $2,600, from the Stormont. The product of the Hanauer smelter was eight cars of bullion, $20,350. The Vienna, of Sawtooth, sent down three bars of bullion, $4,440,

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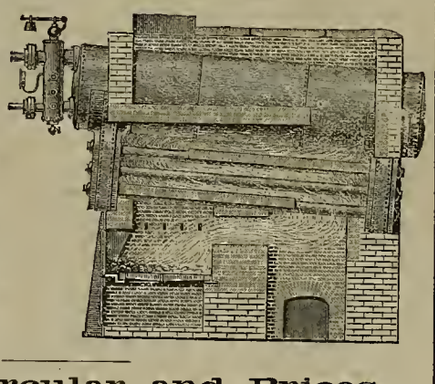

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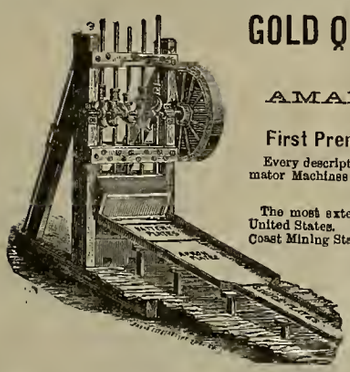

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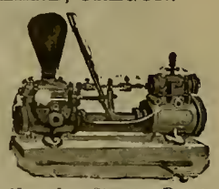

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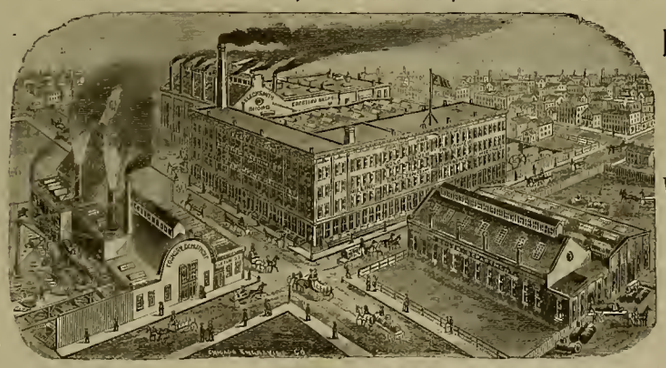

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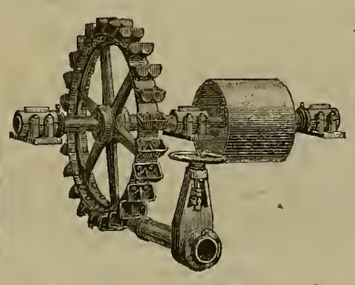

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☞ Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application. Agents for the Patent Plumbago Crucible Co., London, England.

JOHN TAYLOR & CO.

Nevada Metallurgical Works.
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Near First and Market Streets, S. F.

C. A. LUCKHAROT, Manager. ESTABLISHED 1869.

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Ores Sampled.
Assaying in all its Branches.
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Working Tests (practical) Made.
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Gold and Silver Refinery
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GOLD, SILVER and LEAD
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113 Leidesdorff Street,
Bet. California and Sacramento Sts., SAN FRANCISCO.
ASSAYING TAUGHT.

☞ Personal attention insures Correct Returns.

This paper is printed with Ink Manufactured by Charlee Eneu Johneon & Co., 500 South 10th St., Philadelphia. Branch Offices - 47 Rose St., New York, and 40 La Salle St., Chicago. Agent for the Pacific Coast—Joseph H. Dorety, 529 Commercial St., S. F.

Market Reports.

Lumber at Wholesale.

The prices of lumber are fixed by the Association, but there is now so much "cutting under" that it is difficult to state any fixed price. Since the break in the Association which occurred recently, the prices have been much lowered from the figures given, which are, however, those agreed upon. Quotations of cargo rates are as follows for redwood lumber, for delivery at San Francisco, Oakland, Alameda, Berkeley, Vallejo, Benicia, Port Costa, Martinez and Antioch:

ROUGH—No. 1 rough merchantable, $18; No. 2 (refuse) rough, $14; No. 1 rough boards (specified width, 10 inches and over), $19; No. 2 (refuse) do do do, $14; No. 1 rough lumber, surface one side, $21; No. 2 (refuse) do do do $18.

PICKETS—Rough square pickets, $12; rough pointed do, $14; fancy pointed do, $22.

HALF-INCH LUMBER—No. 1 ½-inch surfaced, board measure, $40; No. 2 do do do, $39; No. 3 do do do, $33; No. 4 (refuse) do do do, $32; No. 1 ½-inch battens, board measure, $40; No. 2 (refuse) do do do, $32; No. 1 ½-inch siding, 12 ft. and over, b m, $40; No. 2 (refuse) do do do $32; ½-inch siding, under 12 ft, $32.

RUSTIC—No. 1 Rustic, 1x10, 12 ft and over, $33; No. 2 do do do, $32; No. 3 do do do, $31; No. 4 Rustic, 1x10, $28; No. 5 (refuse) do do do, $21; No. 1 Rustic, 1x8, 12 ft and over, $31; No. 2 do do do, $30; No. 3 do do do, $29; No. 4 Rustic, 1x8, $26; No. 5 (refuse) do do do, $21.

CLEAR—No. 1 surfaced and rough clear, $32; No. 2 do do do, $31; No. 3 do do do, $30; No. 4 (refuse) do do do, $24; No. 1 surfaced and rough clear, 1x8 and 1x6, $30; No. 2, do do do, $29; No. 3 do do do, $28; No. 4 (refuse) do do do, $24.

[Dimensioned, Surfaced and Rough Clear (widths and lengths), 12 inches wide and over, add $1 ₱ M (on each corresponding grade) to the above list price of "Clear."]

TONGUED AND GROOVED—No. 1 T and G, 1x4, 12 feet and over, $32; No. 2 (refuse) do do do, $24; No. 1 T and G, 1x6, 12 ft and over, $30; No. 2 (refuse) do do do, $24; T and G, 1x8, 7 to 11 ft, $26; do do, under 7 ft, $23.

TONGUED, GROOVED AND BEADED—No. 1 T, G and Beaded, 1x4, 1¼x4 and 1¼x6, 12 ft and over, $32; No. 2 (refuse) do do do, $24; T, G and Beaded, 1x4, 1¼x4 and ¼x6, 7 to 11 ft, $27; do do, under 7 ft, $22.

ROUGH CLEAR—1x6 and under in width, and under 12 ft in length, $24.

[On a credit of 60 days, or a discount at the rate of 1 per cent per month for anticipated payments, and not less than 1 per cent per month added for extension of the same].

We quote cargo rates—Pine—Merchantable Rough, $15 ₱ M; Flooring, $24.20; Stepping, $37 ₱ M; Redwood—Merchantable Rough, $18; Surfaced, $32; Rough Clear, $32; Rustic, $33; Tongued and Grooved, $30; Tongued, Grooved and Beaded, $32.

Lumber at Retail.

Retail quotations for pine, fir and spruce are as follows:

ROUGH MERCHANTABLE—(Ordinary sizes) to 40 feet long, per M ft, $22.50; Rough Merchantable, 1x6, Fencing, $22.50; do do, 1x4, do, $23.50; do do, 1x3, do, $24.50; do do, 1x4, odd lengths, $22.50; do do, 1x6, do $21.50; do No. 2, all sizes, $18.50; do Selected, $26.50; do Clear, other than for T and G and Stepping, $31.

[Rough Clear for T and G and Stepping $1 ₱ M less than price of kind for which intended.]

Dressed T and G Flooring, 1x6, No. 1, vertical grain, ₱ M ft, $32.50; Dressed T and G Flooring, 1x6, No. 1, $32.50; do do do, No. 2, $28.50; Dressed T and G Flooring, 1x3, 1x4, 1¼x4 and over, No. 1, vertical grain, $40.50; do do do, No. 1, $35.50; do do do, No. 2, $29.50; Dressed Stepping, No. 1, vertical grain, $42.50; do do do, No. 1, $37.50; do do, No. 2, $28.50.

SPRUCE—Rough Merchantable, ₱ M ft, $21.50; do Clear, $35; Clear Dressed (shelving), $40; Pickets (rough) board measure, $20.50; Furring, 1x2, per lineal ft, 1c; Laths, 1 and 1-½inch, ₱ M, $3.50; 1½-inch, $4.

[N. B.—For all sizes over 14 inches, and lengths over 40 feet, extra rates].

Retail quotations of Redwood are as follows:

ROUGH MERCHANTABLE—₱ M ft, $22.50; do Selected, $27.50; do No. 2, $18.50; Surface, No. 1 and Rough Clear, $40; do, 1x6, $37.50; do, No. 2, $30; Rustic, No. 1, 1x8, $37.50; do, No. 1, 1x10, $40; do, No. 2, $35; do, under 10 ft, $35; T and G Redwood, 1x4, 1¼x4 and 1¼x6, $40; do do, 6-inch, 12 ft and over, $37.50; do do do, 7 to 11 ft, $32.50; do do do, under 7 ft, $30; do do do, No. 2, $30; do do, Beaded, 12 ft and over, $40; do do do, 7 to 11 ft, $32.50; do do do, under 7 ft, $30; Half inch Surface, $32.50; Pickets, Fancy, $30; do, Rough, pointed, $20; do do, square, $17.50; Siding, ½-inch, $27.50; Battens, ½-inch, per lineal ft, 1c; Shingles, ₱ M, $2.50; Shakes, Split, $11; do, Sawed, $12; Posts, per piece, 13c; Dressed Boards, ₱ M ft, $25.

On a credit of 60 days or less, or a discount of two (2) per cent for cash only. On all credits exceeding 60 days' time, not less than one(1)per cent per month to be added.

Underthe rules of the Exchange, no "lump" sum will be given on any bill of lumber.

Nails.

The market is inactive and the prices appended might be shaded on large orders. We give the price list of the Pacific Iron and Nail Company.

FENCE AND BRAD.—10d to 60d, $2.75: 8d and 9d, $0.25; 6d and 7d, $0.50; 4d and 5d, $0.75; 3d, $1.50; 2d, $2.75. Fence, $0.25.

BARRELS.—¾ inch, $6.00; ⅞ inch, $3.00; 1 inch, $2.50; 1¼ inch, $1.75; 1½ inch, $1.50; 1¾ inch, $1.00; 1¾ inch, $0.75.

LINING.—¾ inch, $4.50; ⅞ inch, $6.00.

TOBACCO.—10d, $0.50; 8d, $0.75; 6d to 7d, $1.00.

CHRCH.—6d to 30d, $1.75.

SLATING.—5d, $1.00; 4d, $1.00; 3d, $1.75; 2d, $3.00.

FINISHING.—2d, 1 inch, $6.00; 3d, 1¼ inch, $4.00; 4d, 1½ to 1¾ inch, $1.75; 6d, 2 inch, $1.50; 8d, 2½ inch, $1.25; 10d, 3 inch and over, $1.00.

CASING AND BOX.—10d to 30d, $0.75; 8d, $1.00; 6d, $1.25; 4d, $1.50; 3d, $2.50.

FINE BLUED.—4d, $1.75; 3d, $3.00; 2d, $3.75.

CUT SPIKES.—All sizes, $0.25.

BOAT SPIKES.—All sizes, $0.75.

Inch half keg 10 cents extra.

TERMS.—Note or acceptance at 60 days with current rate of Exchange on S. F., or a discount of 2 per cent for cash, if remitted within 10 days from date of invoice.

All accounts when due subject to sight draft without notice.

An abatement of 10 cents per keg will be allowed upon orders of 200 kegs or over.

Building Material.

Lime, per barrel, $1.50@$1.60. Plaster, $2.75-3.00. Eastern Plaster, $3.00-3.25. Rosendale Cement, $2.25-2.75. Portland Cement, $3.50-3.75. Fire Brick, per 1,000, $40 @ $45, according to brand; hard, $10.00@$12,00; red, $8.00@$8.50; soft, $7.50; face, $30.00.

Newspaper Agents Wanted.

Extra inducements will be offered for a few active canvassers who will give their whole attention (for a while at least) to soliciting subscriptions and advertisements for this journal and other first-class popular newspapers. Apply soon, or address this office, giving address, age, experience and reference.—DEWEY & CO., Publishers, No. 252 Market St., S. F.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCA	N. NO.	AM'T. LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M and M Co	Alaska	8	50	Dec 10	Jan 11	Jan 31	T J Hay, 306 Pine st
Alta S M Co	Nevada	31	25	Dec 24	Jan 9	Jan 28	W H Whatson, 302 Montgomery st
Best & Belcher M Co	Nevada	31	50	Nov 21	Dec 30	Jan 19	W Willis, 309 Montgomery st
Black Bear M Co	California	2	25	Dec 20	Jan 26	Feb 20	W L Oliver, 328 Montgomery st
Champion M Co	California	17	10	Nov 24	Dec 29	Jan 19	T Wetzel, 522 Montgomery st
Con Amador M Co	California	8	30	Dec 3	Jan 5	Jan 21	F B Latham, 408 California st
Copper Mt Con M Co	California	1	05	Dec 3	Jan 13	Feb 10	A L Perkins, 310 Pine st
Con Va & California M Co	Nevada	1	....	Nov 5	Dec 13	Jan 3	A W Havens, 309 Montgomery st
Eintracht Gravel M Co	California	17	05	Dec 9	Feb 7	Feb 16	H Kuntz, 209 Sansome st
Excelsior M Co	California	9	50	Sept 2	Dec 31	Jan 22	W J Stewart, 215 Sanson e st
Grand Prize M Co	Nevada	17	30	Nov 24	Dec 30	Jan 28	E M Hall, 327 Pine st
Happy Valley Gravel M Co	California	5	03	Dec 15	Jan 21	Feb 9	D M Kent, 330 Pine st
Hale & Norcross S M Co	Nevada	83	50	Dec 8	Jan 13	Feb 3	J F Lightner, 309 Montgomery st
Indian Spring Drift M Co	California	4	05	Nov 21	Dec 22	Jan 21	A B Paul, 328 Montgomery st
Lewis Con M Co	Arizona	5	03	Nov 14	Dec 22	Jan 19	J W Pew, 310 Pine st
Mayflower Gravel M Co	California	27	10	Nov 20	Dec 23	Jan 12	J Morizio, 328 Montgomery st
Marshall M Co	California	2	10	Nov 6	Dec 15	Jan 5	A L Perkins, 310 Pine st
Mexican G M Co	Nevada	23	50	Nov 11	Dec 17	Jan 8	C E Elliott, 309 Montgomery st
Ophir M Co	Nevada	48	50	Nov 12	Dec 17	Jan 6	E B Holmes, 309 Montgomery st
Rainbow M Co	California	12	1b	Oct 24	Dec 1	Dec 29	F F Marhardt, 311 Montgomery st
Scorpion S M Co	Nevada	19	10	Dec 1	Jan 9	Jan 13	G R Spinney, 310 Pine st
Shimmer Con M Co	California	2	05	Dec 18	Jan 19	Feb 12	F F Luby, 330 Pine st
Silver Lining M Co	Nevada	1	07	Dec 16	Jan 24	Feb 19	J. Stadfeld, 419 California st
Standard M Co	California	1	25	Oct 17	Dec 1	Jan 5	W Willis, 309 Montgomery st
Savage M Co	Nevada	61	50	Nov 11	Dec 15	Jan 5	E B Holmes, 309 Montgomery st
Union Con M Co	Nevada	28	50	Nov 5	Dec 9	Dec 30	J M Buffington, 309 California st
Utah S M Co	Nevada	52	50	Dec 19	Jan 26	Feb 14	G F Pratt, 309 Montgomery st
Virginia Creek Gravel Co	California	1	20	Dec 20	Jan 25	Mar 2	J M Quay, 406 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Argenta M Co	Nevada	E M Hall	327 Pine st	Annual	Jan 12
Mountain M Co	C Herrmann		243 Mission st	Annual	Jan 5

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	B L Burling	328 Montgomery st	50	Dec 5
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Dec 15
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Oct 8
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Dec 13
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Nov 28
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Dec 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Nov 6

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Dec. 4.		WEEK ENDING Dec. 11.		WEEK ENDING Dec. 18.		WEEK ENDING Dec. 23.	
Alpha	.75	.95	.75	.80	.60	.70	....	....
Alta	.25	.35	.20	.30	....	.20	....	.20
Andes	....	.25	....	.20	....	.15	....	.15
Argenta	....	....	....	....	....	....	....	....
Belcher	.55	.65	....	.50	....	.30	....	....
Belding	....	....	....	....	....	....	....	....
Best & Belcher	1.00	1.25	.80	1.15	.80	.85	.80	1.50
Bullion	.15	.25	.20	.30	....	....	....	.25
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	....	.30	....	.25	.20	.15	.20	....
Bodie Con	2.40	2.80	2.10	2.70	1.80	2.10	1.95	2.00
Benton	....	.10	....	.05	....	.05	....	.10
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	....	.30	....	.50	....	.30	....	....
California	.10	.15	.05	.35	.30	.35	.35	.40
Challenge	....	.15	....	....	....	.10	....	....
Champion	....	....	....	....	....	....	....	....
Chollar	1.70	2.90	2.40	2.75	2.40	2.60	2.50	2.75
Confidence	.60	.70	....	.65	....	.50	....	.75
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	.10	.15	.05	.35	.30	.35	.35	.40
Con. Pacific	....	.95	.90	.95	1.05	1.10	....	1.10
Crown Point	.75	.90	.65	.75	.60	.75	....	....
Day	....	....	....	.75	....	.75	....	....
Eureka Con	....	2.75	2.40	2.50	....	2.40	....	....
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	.15	.20	.10	.15	.10	.15	....	.15
Grand Prize	.05	.10	....	.10	....	....	....	....
Gould & Curry	1.00	1.30	1.00	1.25	1.05	1.15	1.10	1.25
Goodshaw	....	....	.05	.10	....	....	....	....
Hale & Norcross	2.90	3.25	2.50	3.00	2.55	2.85	2.50	4.15
Holmes	....	....	3.75	4.05	....	4.00	4.25	4.30
Independence	....	....	....	.15	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	....	.15	....	.10	.10	.15	....	....
Martin White	....	....	....	....	....	....	....	....
Mono	.65	1.00	1.00	2.50	.95	1.30	4.15	4.40
Mexican	.45	.65	.20	.45	.20	.75	.70	.75
Mt. Diablo	3.75	3.90	3.80	3.95	3.70	4.00	....	....
Northern Belle	....	....	....	....	....	....	....	....
Navajo	2.75	3.25	2.70	3.00	2.00	2.40	1.90	1.95
North Belle Isle	.30	.40	.20	.25	....	.25	....	....
Occidental	....	1.10	....	1.00	.70	.80	....	.75
Ophir	.50	.60	.20	.50	.15	.70	.65	.70
Overman	....	.10	....	.10	....	....	....	....
Potosi	.80	1.15	.85	1.10	.80	.90	.80	1.00
Final Con	....	....	....	....	....	....	....	....
Savage	.75	1.10	.70	1.00	.65	1.30	1.25	1.70
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	1.00	1.20	.70	1.10	.70	.75	.75	.85
Silver Hill	....	....	....	....	....	....	....	....
Silver King	....	....	5.50	5.75	....	....	....	....
Scorpion	....	.15	.05	.10	....	.05	....	.05
Syndicate	....	.45	.40	.45	....	....	....	.35
Tioga	....	....	....	....	....	....	....	....
Union Con	.45	.60	.30	.80	.60	.70	.65	.70
Utah	.70	.85	.60	.80	....	.50	.35	.45
Yellow Jacket	1.05	1.15	.70	1.10	.70	1.10	....	1.00
....	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Dec. 24.

100 Bodie Con 1.90
100 Belcher .60c
200 Bulwer .25c
550 Chollar 2.65@2.70
250 Gould & Curry 1.25
1690 Hale & Nor 4.00@4.10
100 Martin White .35c
500 Mono 1.30@1.35
520 Navajo 2.00
300 Potosi .95c
200 Sierra Nevada .80c
2810 Savage 1.65@1.75
150 Solid Silver .25c
800 Scorpion .10c

AFTERNOON SESSION.

50 Bodie 2.00
440 B. & Belcher 1.40
100 Belle Isle .20c
500 Chollar 2.65@2.70
300 Confidence .75
50 Eureka Con 1.80
350 Exchequer .15c
550 Gould & Curry 1.25@1.30
300 Hale & Nor 3.90@4.00
350 Mono 1.25
200 N. Belle Is .25c
20 Ophir .65c
620 Potosi 1.00
200 Scorpion .05c
270 Sierra Nevada .75c
810 Savage 1.60
50 Utah .40c

Bullion Shipments.

Alhambra, December 20th, $18,038; King, 20, $4.007; Hanauer, 16, $5,000; Stormont, 16, $2,600; Idaho ore, 16, $1,400; Horn Silver, 16, $20,000; Ontario, 16, $19,771; Vienna, 16, $1.770; Christy, 16, $1,380; Hanauer, 17, $2,700; Crescent, 17, $2,500; Horn Silver, 17, $7,500; Christy, 17, $1,300; Minnie Moore, 17, $2,230; Hanauer, 18, $2,750; Queen of the Hills, 18, $2,820; Eureka, 18, $2,600; Horn Silver, 18, $10,000; Minnie Moore, 18, $2,896; Vienna, 18, $3,670; Horn Silver, 19, $10,000; Ontario, 19, $15,212; Navajo, 22, $14,000; Syndicate, 16, $5,069; Hanauer, 21, $5,000; Horn Silver, 21, $10,000; Ontario, 21, $13,740; Queen of the Hills, 20, $4,300; Horn Silver, 20, $10,000; Christy, 20, $1,406. The banks of Salt Lake City report the receipts for the week ending December 17th, inclusive, of $127,864.13 in bullion, and $25,696 in ore, a total of $153,560.13.

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Dec. 24, 1884.

ANTIMONY—Per pound		
Hallett's	12½@	—
Cookson's	13@	—
BORAX—Refined	7½@	8
IRON—Glengarnock ton	25 00@	—
Eglinton, ton	24 00 @	—
American Soft, ton	25 50 @	—
Oregon Pig, ton	— @	—
Clipper Gap, Nos. 1 to 4	— @	—
Clay Lane White	22 00 @	—
Shotts, No. 1	25 00 @	—
Refined Bar	3 @	5½
Boiler, 1 to 4	5 00 @ 5 50	
Plate, 5 to 10	4½@	4¾
Nail Rod	7 @	—
Norway, according to thickness	6 @	7
STEEL—English, lb	16 @	25
Black Diamond, ordinary sizes	13 @	—
Drill	15 @	—
Machinery	12 @	14
COPPER—Ingot	14 @	15
Brazers' sizes	— @	25
Fire-box sheets	28 @	—
Bolt	23 @	25
Yellow Metal	16 @	17
LEAD—Pig	3½@	3¾
Bar	5 @	—
Pipe	7 @	—
Sheet	8 @	—
Shot, discount 10% on 500 bags: Drop, ₱ bag	1 85 @	—
Buck, ₱ bag	2 05 @	—
Chilled, do	2 25 @	—
TINPLATE—Oldcastle	5 25 @ 6 00	
Charcoal	5 75 @ 6 75	
Coke	5 25 @ 6 50	
Roofing	6 25 @13 50	
ZINC—German	9 @	10
Sheet, 7x3 ft, 7 to 10 lb, less the cask	9 @	10
QUICKSILVER—By the flask	35 00 @	—
Flasks, new	1 05 @	—
Flasks, old	85 @	—
NEW YORK PRICES—		
California Borax, refined	8½@	8¾
Pig Iron, American No. 1	19 50 @20 00	
Pig Iron, American No. 2	18 00 @19 00	
Quicksilver	48 @	50
Lead	3 40 @	—
Copper	11½@	—
Bar Silver	1 07¾@	—

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & CO.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING DECEMBER 16, 1884.

309,431—NECKTIE AND COLLAR FASTENER—F. D. Adams, Auburn, Cal.

309,287—BRAKE SHOE—A. R. Bidwell, Greenville, Cal.

309,331—PUMP—L. Bouvier, San Diego, Cal.

309,296—ROTARY ENGINE—J. C. Edmunson, Salinas, Cal.

309,226—CONSUMING FURNACE—J. W. Hubber, S. F.

309,506—CABLE GRIP—Isaac Hyde, Oakland, Cal.

309,264—MOVABLE JETTY—R. T. Van Norden, S. F.

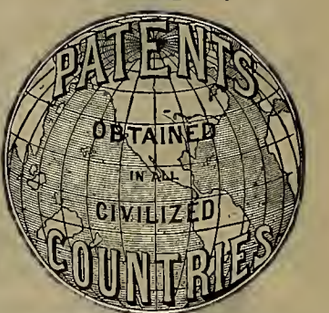
309,327—PACKING PAD—I. B. Wolland. S. F.

15,625—DESIGN—J. S. Newland, Carson, Nev.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise), at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

ONE of the French spoilation claimauts, "Uncle" Silas Savage, died in the almshouse in Hartford, Conn., at the age of 89, on the very day that the United States Senate passed the bill referring these claims to the Court of Claims. His claim originally amounted to $175,000., but with interest added to several millions.

Dewey & Co.'s Scientific Press Patent Agency.



OUR U. S. AND FOREIGN PATENT AGENCY presents many and important advantages as a Home Agency over all others, by reason of long establishment, great experience, thorough system, intimate acquaintance with the subjects of inventions in our own community, and our most extensive law and reference library, containing official American and forcign reports, files of scientific and mechanical publications, etc. All worthy inventions patented through our Agency will have the benefit of an illustration or a description in the MINING AND SCIENTIFIC PRESS. We transact every branch of Patent business, and obtain Patents in all countries which grant protection to inventors. The large majority of U. S. and Foreign Patents issued to inventors on the Pacific Coast have been obtained through our Agency. We can give the best and most *reliable* advice as to the patentability of new inventions. Our prices are as low as any first-class agencies in the Eastern States, while our advantages for Pacific Coast inventors are far superior. Advice and Circulars free.

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Mining Share Market.

Our mining stock tables do not show any very marked fluctuation as having occurred during the work. The situation on the Comstock is unchanged.

At the north end of the lode they have withdrawn from the lower levels to resume explorations at points formerly passed by above in the race for depth. All the pumps, air pipes, compressed air pipes and track irons have been hoisted up, and all soft spots of ground in the drifts have been left securely lagged up. The water being allowed to suddenly flow in and cover all this work, the drifts and stations will stand for ages, and remain tight and sound as a bucket. All can be pumped out again whenever it shall be thought advisable to look further into the lower levels.

In the Union Consolidated they are now cleaning out and repairing the main drift on the 2300, 2500 and 2700 levels preparatory to the resumption of explorations at those points. All the north end mining companies will now soon be going for ore, wherever it is to be found, and will take up and follow the loose ends of ore streaks formerly left behind. In doing this it is thought they are liable to run into bonanzas, the existence of which has heretofore not been suspected.

At the middle mines they will soon be in a position to advantageously conduct explorations from the 3000 level to the surface. The new hydraulic pump will be running, and the next in order will be the running of a drift from the 3000 station of the Combination shaft to the bottom of the Hale and Norcross winze, which has already reached the level named. This connection will not only form a drain for whatever water may be tapped, but will also afford avery valuable circulation of cool air.

At Gold Hill all is going on much as usual. There is now an abundance of water in the Carson river, and all the mills are running to their full capacity.

Agents' Promises.

We do not intend that the agents for this paper shall make any promises they are not authorized or able to fulfill; and such as they do offer, we desire to have properly carried out. To this end, we would thank our patrons to inform the office personally should there seem to be any neglect at any time in this direction, as we have no other way of knowing it if an agent, or correspondent, should willfully or by oversight neglect to fulfill a promise.

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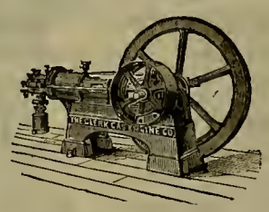

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Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
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A. C. KNOX—Nevada State).
GEO. MCDOWELL—Santa Clara County.
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G. W. INGALLS—Arizona.
W. WHITWELL Oregon.
M. S. PRIME—Alameda County.
MRS. OZIER, Humboldt County.

At the World's Fair.

Back numbers and the latest files of this paper will be found in the California Department, and also in the Newspaper Exchange Department, of the World's Fair, New Orleans. Mr. W. H. Jessup, of the horticultural section of the California Department, can be consulted on business terms for this office, extra copies, etc.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

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DIVIDEND NOTICE.

San Francisco Savings Union,

532 California Street, cor. Webb.

For the half year ending with December 31, 1884, a dividend has been declared at the rate of four and thirty-two one-hundredths (4 32-100) per cent per annum on term deposits, and three and six-tenths (3 6 10) per cent per annum on ordinary deposits, free of taxes, payable on and after Friday, January 2, 1885.

LOVELL WHITE, Cashier.

DIVIDEND NOTICE.

The German Savings and Loan Society.

For the half year ending December 31, 1884, the Board of Directors of the German Savings and Loan Society has declared a dividend on term deposits at the rate of four and thirty-two one-hundredths (4 32-100) per cent per annum, and on ordinary deposits at the rate of three and six-tenths (3 6-10) per cent per annum, and payable on and after the 2d day of January, 1885. By order

GEO. LETTE, Secretary.

OFFICE OF THE

Plymouth Con. Gold Mining Co.,

No. 23 Nassau Street, Dec. 1, 1884.

DIVIDEND No. 19.

The Board of Trustees of this Company have this day declared the regular monthly dividend of fifty thousand dollars, being one per cent on the capital stock, or Fifty Cents per share, payable on the 5th inst.

W. VAN NORDEN, President.

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NOTICE is hereby given that at a meeting of the Board of Directors, held on Wednesday the third day of December, 1884, an assessment (No. 1) of one dollar per share was levied on the capital stock of the corporation, payable immediately in United States gold coin to the Secretary at the office of the company, 302 Pine St., San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on Wednesday the fourteenth day of January, 1885, will be delinquent, and advertised for sale at public auction, and unless payment be made before, will be sold on Monday the second day of February, 1885, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

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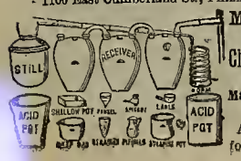

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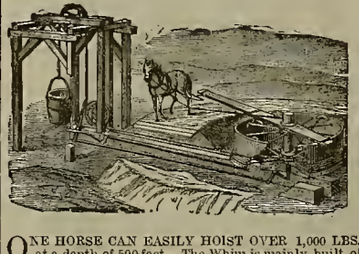

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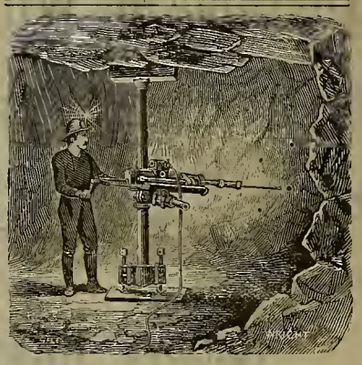

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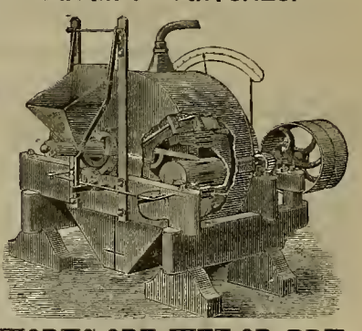

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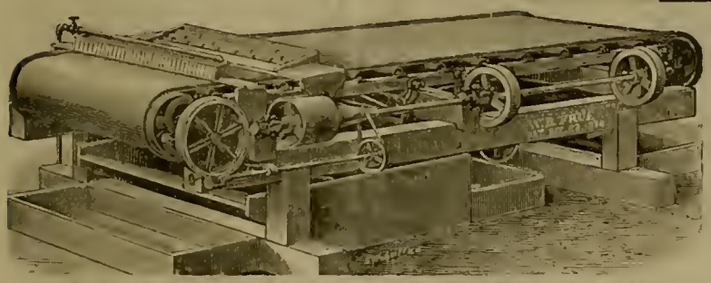

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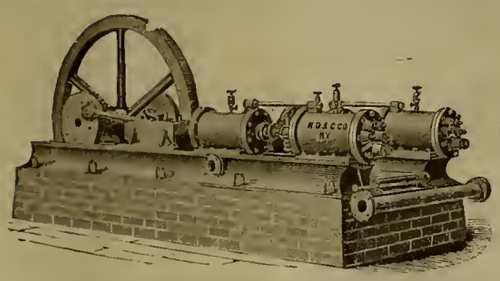

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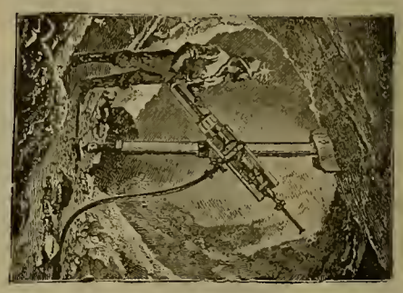

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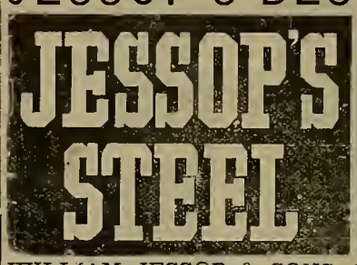

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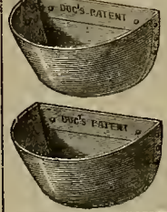

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